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Towards Sustainable Mixed Reality Technology Institutionalization at a Major Urban College in British Columbia, Canada

Brent Fraser Mekelburg
University of Western Ontario, bmekelbu@uwo.ca

Abstract

The organization at the centre of this Organizational Improvement Plan, College X, is a publicly funded college located in a major urban centre in British Columbia, Canada. The problem of practice is the inconsistent implementation for disruptive technology—mixed reality (MR). Currently, faculty are in charge of integrating MR into andragogy. Decisions that enable or hinder MR institutionalization are made by administration; faculty needs and administration support are not necessarily aligned. Failed institutionalization not only deprives learners of the opportunity to acquire digital literacy skills but also threatens institutional legitimacy. Within his role as a program leader, the author proposes a conceptual framework for digital transformation: towards sustainable technology institutionalization (TSTI). Drawing upon an adaptive approach to change (Cawsey, Deszca, & Ingols, 2020), TSTI is influenced by the concerns-based adoption model for technology adoption (Hall & Hord, 2015; Hord, 1997), authentic leadership (Begley, 2001, 2004, 2006; Gardner, Cogliser, Davis, & Dickens, 2011; Walumbwa, Avolio, Gardner, Wernsing, & Peterson, 2008), and distributed leadership principles (Gronn, 2008; Rogoff, 1995; Spillane, 2006); viewed through a functionalist lens (Garner, 2019; Stepnisky, 2019); and influenced by neoinstitutionalism theory (Meyer & Rowan, 1977; Powell & DiMaggio, 2000, 2012). The plan leverages the digital capabilities maturity model (Uhl, Born, Koschmider, & Janasz 2016) to monitor and assess digital transformation and MR institutionalization. Over time, TSTI will help College X to concurrently achieve its vision of transformative learning and its mission to create positive futures by providing sustainable and applicable education (College X, 2016). This plan presents an organizationally sustainable, coordinated implementation strategy.

Keywords: digital transformation, innovation, institutionalization, sustainability, mixed reality, augmented reality, virtual reality, higher education leadership

Executive Summary

Students are increasingly demanding educational experiences that are current, relevant, and deemed to have excellent value (Hedley, 2010; Meek, Goedegebuure, Santiago, & Carvalho, 2010; Murphy, 2016). One way that students evaluate the quality of higher education is the prevalence of technology in program delivery and acquisition of digital literacy skills, which includes mixed reality (MR) technology. Many higher education institutions have responded to market demands for innovation in an erratic manner that is simply not sustainable (Bates & Sangra, 2011). College X in British Columbia, Canada, has an explicit strategic direction of innovation, yet efforts to institutionalize MR, such as the annual President's Innovation Competition, are temporary. Furthermore, faculty who integrate MR into their andragogy often operate in isolation; success is limited to their own classrooms and effectiveness of integration is constrained (Elsaadani, 2013; Jacobsen, 1997).

Through consistent implementation of a digital transformation plan for MR—institutionalization—College X can become a leader in providing learners with digital literacy skills and furthering institutional legitimacy, thereby enhancing the college's vision of providing transformative learning. The findings, conclusions, and recommendations of this OIP are provided in this report.

Findings

Three key external trends have led to the vision and need for MR institutionalization: the Fourth Industrial Revolution (Birt & Cowling, 2016; Schwab, 2017), a diversifying British Columbia economy (Muir, 2016), and increased competition for tuition due to declining public funding (Canadian Association of University Teachers [CAUT], 2015). A closer look at College X's approach to MR has revealed several findings.

The responsibility for the efficient deployment of resources rests with administration. Decisions to integrate MR into andragogy rest with faculty. If these are not aligned, MR institutionalization fails. College X's current approach to MR technology is disjointed at best—diffusion of technology is problematic, and efforts remain unsustainable and lack institutional coordination. Students are not acquiring MR literacy skills, and institutional legitimacy is suffering. Classes and programs that have successfully implemented MR into their curricula show increased student engagement, persistence, and achievement (Hoareau, Querrec, Buche, & Ganier, 2017; Merchant, Goetz, Cifuentes, Keeney-Kennicutt, & Davis, 2014).

This study found several problematic areas that require attention: lack of desire for change, non-existent action, constrained resources, competing strategies, and nascent technology. Additionally, external awareness, lack of demand, sector striation, and lack of best practice guidelines all must be addressed.

Conclusions

Critical organizational analysis reveals that an adaptive-type change is needed to lead the digital transformation of College X. The solutions are thus informed by the findings:

1. Collect internal data on MR institutionalization.
2. Establish digital equity for students.
3. Build expertise capacity.
4. Enhance hierarchical communication.

Recommendations

The following recommendations are proposed to effectively and efficiently lead MR institutionalization at College X. The solutions adapt and align institutional processes already in place and are aligned with the findings and conclusions:

1. Assess and monitor MR institutionalization leveraging the digital capability maturity model (Uhl et al., 2016)
2. Acquire 30 MR-enabled iPads for small-scale validation of MR-integrated andragogy.
3. Create a sustainable technology committee mandated to establish a professional learning network capable of expanding and building expertise capacity at College X.
4. Promote MR technology use directly to key stakeholders via social media to raise awareness.

This plan seeks to align bottom-up, faculty-led initiatives with top-down, administration-led allocation of resources, to promote a feasible route for sustainable institutionalization of MR. Although the content of this plan is based on the institutionalization of MR and digital transformation at College X, leadership and sustainability are at the core. The question becomes how to best reconfigure roles and tasks to ensure meaningful experiences and effective education for students. Efforts towards the sustainability of MR institutionalization should focus on the project outliving the leader (Perlmutter, 2020). To this end, the innovation rests with the processes that are put in place to ensure sustainability of an initiative long after a leader has vacated their role. A detailed analysis and plan are provided in the body of this paper.

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"Where you stumble, there lies your treasure…"—Joseph Campbell

Motivation, time, and money are all vital to completing a doctorate. There are no shortage of wizards and dragons who have helped me with these resources and treasures on this journey, and I would like to take this time to acknowledge their contribution.

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"Necesito del mar porque me enseña…"—Pablo Neruda

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Abbreviations

AL	Authentic leadership
AR	Augmented reality
BC	British Columbia
CBAM	Concerns-based adoption model
CIO	Chief information officer
CPM	Change path model
DCMM	Digital capabilities maturity model
DIT	Diffusion of innovation theory
DL	Distributed leadership
HE	Higher education
HEI	Higher education institution
IT	Information technology
MR	Mixed reality
NIT	Neoinstitutionalism
OIP	Organizational Improvement Plan
PESTE	Political, economic, social, technological, and environmental
PICK	Possible, implement, challenge, and kibosh
PoP	Problem of practice
SES	Socioeconomic status
SMART	Specific, measurable, attainable, realistic, and time-constrained
TSTI	Towards sustainable technology institutionalization
VR	Virtual reality

Glossary

Augmented reality: an interactive experience where computer-generated holograms enhance real-world environments and appear to the viewer simultaneously.

Concerns-based adoption model: a model that describes how people develop as they learn about an innovation and the stages of that process.

Digital capabilities maturity model: a modern approach to measuring the digital capabilities of higher education institutions.

Disruptive technology: disruptive technology is understood to be innovation that displaces traditional models (Bower & Christensen, 1995). MR technology, including VR and AR, is disruptive as it aims to challenge traditional approaches to lecturing.

Mixed reality: the confluence of virtual and real worlds to create new environments and visualizations, where digital objects coexist with physical objects concomitantly.

Towards sustainable technology institutionalization: a conceptual model created by Brent Mekelburg that incorporates multiple theories outlining the process of sustainable technology institutionalization in higher education institutions.

Virtual reality: a simulated experience that transports the viewer to an environment separate and different from the real world.

CHAPTER 1: INTRODUCTION AND PROBLEM

Organizational Context

It has been well documented that higher education institutions (HEIs) are operating in a complex world that demands complex solutions to complex problems (Soares, Gagliardi, Wilkinson, & Hughes, 2018). This Organizational Improvement Plan (OIP) introduces and frames contextually the main problem of practice (PoP)—failed technology institutionalization—examines the challenges to leading change, and identifies expected constraints to institutionalizing an innovative technology—mixed reality (MR).

MR is an umbrella term for the confluence of real and virtual worlds where new environments and visualizations are created; physical and digital objects coexist and interact dynamically in real time. MR includes virtual reality (VR), which takes place entirely in a virtual setting, and augmented reality (AR), which projects digital holograms onto the physical environment. Both VR and AR allow for three-dimensional appreciation of objects to advantage.

The OIP is grounded by a functionalist theoretical perspective and complemented by an NIT approach to understanding organizations. A conceptual framework, which draws upon the concerns-based adoption model (CBAM) for technology adoption along with authentic leadership (AL) and distributed leadership (DL) theory, is presented in subsequent chapters.

The institution that this OIP focuses on and where I work as a program leader, College X, is a publicly funded HEI located in a major urban centre in British Columbia (BC), Canada. Provincially, College X is one of 12 publicly funded colleges. Regionally, due to the relatively close proximity of colleges in the lower mainland of BC as well as Vancouver Island and the Fraser Valley, there are five colleges within 300 km of each other. Furthermore, there are an additional 13 universities within that same distance. Students have a crowded field of HEIs to

choose from, without having to travel far from home. Inherently, there is a high level of institutional competition for students within this region, and one of the ways that organizations respond is through differentiation. A closer look at institutional vision, mission, and values provides clues about how an HEI positions itself in this crowded market, and College X is no exception.

Institutional Vision, Mission, and Values

My institution sets out its vision, mission, and values in a policy that is approved by the Board of Governors (College X, 2011). The vision is inspiring lives through transformative learning. The mission serves to clarify why the organization exists, which is to create positive futures by providing sustainable and applicable education. The policy outlines that the values represent what the organization believes in and what guides decision-making. There are three major values: Learning, Service, and Leadership. The three headings as well as the subheadings are noticeably articulated in the plural, collective, first person: "we." Under the Learning values heading, the values are lifelong, self-directed, collaborative, flexible, accessible, and practical learning. The Service values include excellence in service to students and community, continuous improvement of services and programs, and collaboration across the college. The Leadership values include the development of leaders, intelligent risk taking, creativity, innovation and imagination, as well as the courage of the change agent.

Organizational Structure and Established Leadership Approaches and Practices

This section discusses the organizational structure of College X, leadership practices, and connection to institutional vision and strategy.

Organizational structure. The organization is a public postsecondary institution. The Board of Governors administers the college on behalf of the provincial government and the

Ministry of Advanced Education as outlined in the Colleges and Institutions Act (Government of British Columbia, 1996). The board acts on behalf of the public, establishes policy that guides the institution, and hires the president. Whereas the board focuses on strategic leadership, the president is the head of administrative detail. Under the guidance of the president, four vice-presidents handle the following portfolios: Education, Student Experience, Administration, and Partnerships (College X, 2019). The Education portfolio deals with academics; Student Experience deals with student services; Administration covers facilities, finance, human resources, and information technology (IT); and Partnerships handles advancement, alumni relations, continuing education, international education, and external relations.

Established leadership approaches and practices. Leadership at College X follows the structure closely. The organizational chart is clearly hierarchical and characterized by a tall, or vertical, reporting structure. Drawing on Handy's (2007) nomothetic metaphors of organizations, the established leadership approaches and practices adhere to a *role culture*.

A role culture, which is stereotyped as a hierarchical bureaucracy, is characterized by specialized departments and procedures, and overseen by a narrow band of senior management (Trowler, 2008). Furthermore, actors have clearly delegated authorities in a highly defined structure, power is derived from position, and little scope exists for expert power (Handy, 2007). The organizational chart mirrors a hierarchical bureaucracy, from the Board of Directors at the top, down to the president and then vice-president. Furthermore, organization follows along specialized departments, including Academic, Administrative, Student Experience, and Partnerships. Leadership, in this context, is defined by the possibilities made available by role. Furthermore, additional leadership constraints at the individual as well as organizational level are

inherent in a role culture: Low levels of cooperation and low levels of power distribution (Mulder, 2018) hinder flexibility.

In this light, College X relies on strategic planning to provide direction for initiatives. Although consultation and collaboration allow for sharing of ideas from the bottom up, it is in fact top-down leadership that refines the input and sets the strategic direction of the institution. At first glance the strategic plan, along with the vision, mission, and values, appears to be grounded in risk, change, and liberalism. Examples of this connection between guiding documents and underlying motivations include change agency, flexibility, continuous improvement, risk taking, and innovation (College X, 2011). Each provides semantic clues about established leadership practices; careful discourse analysis reveals their true nature.

Closer inspection reveals how these virtuous ideals are tempered towards a role culture. Change agents have no formal structure or procedure, let alone resources required to make changes. Flexible learning is limited by assets provided; faculty who ask for resources must follow a hierarchical procedure defined by roles—only department chairs can seek approval for such items. The irony is that those who handle flexible education are divorced and excluded from the process in place to access resources because the established practice is defined by role. Faculty's responsibility is to teach, not to procure resources. Continuous improvement as a formal process is addressed through the leadership practice of program review and renewal. This process relies on resource-constrained possibilities established from institutional leadership. Any ideas that fall outside of fiscal responsibilities are hampered, contained, or denied. In this sense, improvement is defined by budgetary constraints, not idealism. Risk, as articulated in the vision, mission, and values policy, is tempered by the conservative term *intelligent* and innovation is framed by a cost-recovery metric that is supported if efficiencies are gained. Taken together, it

becomes apparent that the true nature of established leadership approaches and practices at College X is firmly grounded and defined by a role culture.

Organizational history: Connection to current vision and strategy. College X obtained official status as a college in 1970, offering university transfer, vocational, and upgrading courses. Rapid expansion during the 1980s and 1990s increased available options in the trades, business, healthcare, and technologies. By the turn of the century, the rapid growth was captured and assessed through the first economic impact study that revealed just how significant the institution was to the local economy. College X has always maintained a powerful sense of community service and connection to the wider population. The organization has a long-standing, mutually beneficial, and respectful relationship with the Indigenous communities upon whose traditional territories staff work, live, and learn. Because the history and growth of College X is grounded upon a close connection to the community, institutional success has always been predicated on careful consideration of the needs of learners, stakeholders, and partners. Strategic direction has always been measured, especially during tenuous times of economic downturns. It is no surprise then, that although explicitly ambitious, the reality of the strategic plan, alongside the vision, mission, and values, is muted by implicit constraints. The historical trajectory of the institution has been marked by a need to prove legitimacy, grow responsibly, connect to the community, and to carve out a niche in the higher education (HE) field through differentiation. Looking to the future, the strategic plan and vision, mission, and values policy are operationalized in a way that aims to continue a steady, safe, and secure path. A role culture that enacts these policies and procedures hampers any efforts that threaten this stability, regardless of how beneficial they might be.

Leadership Position and Lens Statement

It light of institutional context, this section discusses agency, power, and personal voice as part of my overall personal leadership position.

Position Statement: Leadership Approaches

As a faculty member and program leader, I have one foot firmly planted in the classroom and, to a lesser degree, I am also entrenched in administration. I have relational capacity and access to decision-making processes. To this extent, it is important to consider my agency, power, and voice when it comes to my leadership position. Furthermore, it becomes important to explicitly articulate my theoretical approach to leadership practice because it reveals much about limitations and possibilities to address the PoP through the OIP. Further articulation of my AL and DL approach is included in Chapter 2.

Agency. Agency is defined as the capacity of individuals to act independently and to make their own free choices (Barker & Jane, 2016). In this sense, in my role I have considerable agency over some aspects of my work, yet in others I am constrained. As mentioned, my institution clearly operates in a role culture. The structure imposed, as evidenced by the organizational chart, reveals that my decisions about my classroom and how I lecture are well within my domain and I have complete academic freedom to make decisions about my andragogy. Decisions about the procurement of resources (hardware, software, etc.) are beyond the scope of my role as a faculty member. As a program leader, my role is to oversee the general operations of my program, and I have the choice to raise issues at meetings and to engage other faculty members about integration strategies for MR technology in our program. To this end, my agency as defined by my role has elements of personal leadership capacity as well as peer

influence capacity, which are worth enacting as part of a leadership strategy to integrate MR into curricula.

Power. Luthans (2011) defined power as the capacity of an individual to influence the conduct or behaviour of others. Although my personal power is limited because I am operating within a role culture, it is not to say that my power is nonexistent. As a faculty member I need to rely on my contextual understanding of the organizational realities at play to strategize an approach that allows me to exert power within my role. This chapter later examines how College X is characterized by the confluence of bureaucracy—administration, collegium, and faculty (Manning, 2018). Any ability to move an initiative forward needs to be navigated within the political realm. To this extent, my power within the collegium is characterized as expert, referent, and professionally situated (Manning, 2018). Conversely, my power within the bureaucracy realm is constrained and defined by a lack of legitimate, reward, or coercive power (Manning, 2018). The path forward, towards sustainable technology institutionalization, requires that power be accessed and enacted through leveraging coalitions and relational capacity.

Personal voice. In the context of a role culture, faculty members are excluded from decision-making processes. It is well established that administrative decisions are based on the dominant group's—administrative—voice, as exercised through legitimate power, despite efforts to listen to faculty concerns. Muted group theory shows how marginalized groups are oppressed, and inequity exacerbated, by the dominant group's creation of language systems (Turner & West, 2010). As applied to institutional context, my voice as a faculty member is thus seen as muted, and I am excluded from decision-making processes that would advance sustainable technology institutionalization. Despite this reality, all hope is not lost. The dominant language system can be learned—I argue that it *must* be learned—to communicate across organizational

realms effectively and efficiently. This is understood to mean that any faculty-led initiative must be translated and framed in the language of the dominant decision-making group—administration—to be considered. Language is important. Similarly, administrative-led initiatives may be dismissed by faculty, faculty because not communicated in collegial terms. In context, my personal leadership approach will need to be adaptive in order to advance sustainable technology institutionalization.

Leadership Lens

AL emphasizes building the leader's legitimacy through honest relationships that are built on an ethical foundation with followers who value their input (Gardner, Cogliser, Davis, & Dickens, 2011). Additionally, authentic leaders are positive people with truthful self-concepts who promote openness. By building trust and generating enthusiastic support from their subordinates, authentic leaders can improve individual and team performance (Gardner, Avolio, Luthans, May & Walumba, 2005). My leadership lens is based on AL (Begley, 2001, 2004, 2006; Bhindi & Duigan, 1997; Gardner et al., 2011; Henderson & Hoy, 1983; Walumba, Avolio, Gardner, Wernsing & Petersen, 2008) because it is the most effective in advancing the initiative through leveraging trusting relationships. Furthermore, it is supported by DL (English, 2007; Gronn, 2008; Hutchins, 1995; Murphy, 2009; Rogoff, 1995; Spillane, 2006) to leverage informal teams and relationships. DL is understood to analyze how tasks are stretched across an organization. DL eschews the individual characteristics of the leader or features of the situation, in favour of viewing leadership as a situated and social process (Benson & Blackman, 2011).

Although a strong role culture dominates College X, there also exists to a lesser degree a *task culture* that is enacted when smaller projects arise that have not yet been operationalized or formalized. A task culture is characterized as team based and problem oriented, tasks are

prioritized over power, expertise is valued, power is distributed, creativity is paramount, and results or outcomes are the goal (Mulder, 2018). The primary leadership goal is to derive informal leadership through communicating with administration—the president, vice-president, or dean —in order to sway them to formally strike a sustainable technology institutionalization committee. The aim is to rely on AL and DL so I can be an effective and efficient contributor as part of a task culture endeavour; leadership is discussed in Chapter 2.

Leadership Problem of Practice

The PoP addressed in this OIP is the inconsistent implementation for disruptive technology at a publicly funded major urban college in BC, Canada. For the purposes of this OIP, disruptive technology references MR technology, including VR and AR. Faculty who integrate MR technology into their andragogy often operate in isolation; success is limited to their own classrooms and the effectiveness of integration is constrained (Elsaadani, 2013; Jacobsen, 1997). Responsibility for the efficient deployment of resources and MR funding, support, and planning exist external to the department. Decisions that enable or hinder MR institutionalization are made by detached, higher levels of administration with disparate intrinsic motivations; faculty needs and administration support are not necessarily aligned. Failed institutionalization of MR not only robs learners of the opportunity to acquire digital literacy skills but also threatens institutional legitimacy. What strategies might be used to effectively and efficiently lead MR institutionalization at a publicly funded college on the west coast of Canada?

Organizational Gap

In this section, the current organizational state is described and compared to the desired state, thereby revealing the organizational gap.

Current state. The pace at which innovative technology is emerging is rapidly accelerating. Technology affects all aspects of people's lives, and HEIs are not exempt. Inevitably, changes due to technology have created contemporary challenges (Eckel, Green, & Barblan, 2002) that traditional HEIs are unable to address adequately. Manning (2018) mused that technology offers the greatest potential for change, both positive and negative (p. 4).

Neoliberalism is also reshaping HEIs (Olssen & Peters, 2005); students increasingly view HE as a consumer product to be openly traded in the free labour market as part of knowledge capitalism. As tuition fees rise, students are demanding educational experiences that are current, relevant, and deemed to have good value (Hedley, 2010; Meek et al., 2010; Murphy, 2016). One way that students evaluate the quality of HE is in the prevalence of technology in program delivery.

Many HEIs have responded to market demands for innovation in an erratic manner that is simply not sustainable (Bates & Sangra, 2011). Sustainability of MR initiatives in HEIs is tenuous at best; if MR projects do get funding, it is usually one-time only. Alternatively, many ideas fail to be realized due to inadequate or inaccessible resources. Funds, time-release, or even curriculum development help are constrained. Classes and programs that have successfully implemented MR into their curricula show increased student engagement, persistence, and achievement (Hoareau, Querrec, Buche, & Ganier, 2017; Merchant, Goetz, Cifuentes, Keeney-Kennicutt & Davis, 2014). Additionally, students who have engaged with MR are better prepared for the workplace demands of employers who are increasingly seeking graduates with MR skills and knowledge, regardless of field of study.

Despite all the well-documented benefits of MR as an educational technology and alignment with organizational goals, diffusion of technology remains problematic. The current

organizational state is characterized by sporadic ventures leveraging technology. A few early adopters—self-taught and intrinsically motivated—have integrated MR into their lectures. These efforts remain unsustainable and lack institutional coordination.

Desired state. The desired organizational state is to create a well-articulated, sustainable, and coordinated plan that propels MR from adoption to integration, and through to institutionalization. This OIP seeks to align bottom-up, faculty-led initiatives with top-down, administration-led allocation of resources. As a disruptive technology, MR is envisioned to become ubiquitous as a learning tool and establish itself as the new normal for communicating ideas, teaching, and learning and assessing competencies, knowledge, and skills.

Fit

This OIP addresses two key goals articulated within College X's (2016) strategic plan. First, MR institutionalization promotes and provides digital literacy skills, which aligns with the articulated goals of creativity and innovation, and student experience. The student experience as outlined in the strategic plan explicitly endeavours to provide an environment where students will acquire skills and knowledge that effectively support them in building their future. In relation to digital literacy skills, this is understood to mean that College X desires to provide the digital literacy skills that will be needed to help students become gainfully employed in a rapidly digitizing world.

Second, MR institutionalization advances institutional legitimacy, which aligns with the sustainable society goal (College X, 2016). Sustainability is understood to mean more than environment and financial sustainability. Sustainability means institutional credibility in the community, among institutional peers, employers, and students. Furthermore, sustainability means longevity, persistence, and resiliency in the face of external pressures beyond the control

of the organization. The thought process remains: the institution will continue to exist in the future so long as it remains legitimate. Given the recent context of COVID-19, face-to-face instruction has become unsustainable, technology-enabled learning is the new norm to assure continuity, and competitive advantage exists for any institution willing to work towards that vision.

This plan seeks to navigate the complicated middle ground that exists between administration and faculty, idealism and practicality, vision and execution, in order to allow for the innovation agenda articulated in the strategic plan to come to life in a sustainable manner.

Framing the Problem of Practice

Keeping the identified contested middle ground in focus is important to gaining a better understanding of the forces at play that frame the PoP. This section provides a brief historical overview of the PoP at College X and presents relevant theory for contextual understanding of the constrained choices and behaviours faced by faculty and administration.

Historical Overview of the POP

Change theory and diffusion of innovation theory (DIT) serve as a backdrop to understanding the technology acceptance trajectory within an organization. Both are aligned with functionalism and NIT, which are the theoretical lens and perspective described later in this section. Whereas change theory describes how organizations generally accept change, DIT specifically relates to personal change. Functionalism sees parts of the whole working together (Stepnisky, 2019); individuals are inextricably linked to the organization—they *are* the parts of the whole. My discussion in this section reveals how NIT helps understand individual and organizational choices and behaviours as they pertain to MR institutionalization.

One of College X's (2016) mandates is to advocate for socially just education. Kezar (2012) situated HE in an environment characterized by complexity, ambiguity, continuous change, disorder, and nonlinear processes. Keeping this in mind, MR institutionalization will be highly contextual.

Curry (1992) introduced three phases of change as part of an institutionalization framework: mobilization, implementation, and institutionalization. Mobilization is considered the first stage, where consciousness, awareness, critical analysis, and dialogue begin to challenge the existing practices that persist within an organization and where MR adoption takes place. Implementation is the second stage, where infrastructure and support for the reform increases—the reform has not yet become commonplace—and although new work is done, it has yet to be accepted. Implementation is where integration of MR takes place. The final stage is institutionalization, wherein the reform has become embedded in the organization and thus a part of the standard procedures. Taken together, the aforementioned parts are widely recognized as the process of digital transformation. The logical test is to ask whether the reform is considered innovative or not. If the reform is no longer considered innovative, this is a clear sign that institutionalization has taken hold.

At the individual level, DIT describes the progression of innovative technology from introduction through to complete acceptance (Rogers, 2010). DIT is based on the percentage of users in the overall population that are using the innovative technology in practice, dividing the population into subsets based on the temporal adoption of the innovation. Rogers (2010) named the subsets as innovators, early adopters, early majority, late majority, and laggards. Innovators take risks, have high social status, and are connected to other like-minded individuals. Early adopters have opinion leadership, high levels of education, social currency, and effective

communication skills. The early majority are connected to early adopters but lack opinion leadership. The late majority are skeptics, which causes them to adopt innovation more slowly than the early majority; laggards are the last to adopt innovation and typically have the lowest social contact and no opinion leadership.

Considering DIT (Rogers, 2010) in light of institutionalization (Curry, 1992), several important points emerge. First, institutionalization is a macrolevel perspective and considered organizational, while DIT is a microlevel perspective and considered individual. Second, both theories refer to the introduction of an innovative technology, including mobilization and adoption, as well as the use of an innovative technology in practice—namely, implementation and integration. Third, they include the conceptual wide acceptance of an innovative technology and name them institutionalization and critical mass acceptance. Furthermore, both pay close attention to the human aspect of accepting innovative technology, regardless of whether it is a personal or an organizational dimension. Considering these theories, critical reflection of the historical context of the PoP demonstrates aligned progression of the diffusion of innovative technology personally as well as organizationally.

After acquiring the hard assets required to experiment with MR through innovation funds awarded by the college's president, I have been able to successfully adopt and integrate MR into my andragogy and curriculum. I have hosted several peer educational opportunities and interest has been generated across disciplines. Although MR initiatives have been integrated within my classroom, they have failed to become institutionalized. Despite recognized and articulated benefits from students, peers, and the president, MR institutionalization has stagnated; barriers clearly persist.

A few related issues are embedded within MR institutionalization—namely, authority, power, idealization, and social justice (Kezar, 2018). Additionally, there are tensions between institutional roles that need to be bravely questioned and critically analyzed. Because MR is new, authority over best practices and implementation is contentious. The issue of power over use of new technology like MR becomes a point of tension as well (McCluskey & Winter, 2014); academics will never accept administration dictating the requirement to implement MR. The issue of social justice is intertwined with the idealization of students (Gordon, 2014). A close look at how College X idealizes students based on underlying processes, structures, and relationships reveals unintentionally created barriers to accessing education. It becomes important to consider these issues in order to demonstrate authenticity, maintain trust, and retain community support.

Organizational Theories, Lenses, and Frameworks

Considering historical context and framed by notions of institutionalization and DIT, a closer look at the situational organizational context is beneficial to advancing understandings of the environment at College X.

Theoretical lens: functionalism. My interrogation is predicated on a functionalist theoretical lens because it sees parts working with each other to achieve equilibrium (Macionis & Gerber, 2010). Further, along with the relational requirement, functionalism will constrain choices and define roles; consensus will be needed to advance MR institutionalization through shared values (Stepnisky, 2019) between administration and faculty. Additionally, functionalism views change as inevitable and a natural progression, which provides insight about innovation (Garner, 2019).

Theoretical perspective: neoinstitutionalism. Traditional institutionalism examines group conflict and focuses on ways to become effective. Organizations constrain individualism and informal structures influence the formal structure of the organization; legitimacy is gained through adherence to rules. NIT came about because traditional institutionalism neglected cognition and learning in human behaviour and motivation. Meyer and Rowan (1977) and Rowan and Miskel (1999) contributed significantly to NIT, but the most important work was by DiMaggio and Powell (2000) and Powell and DiMaggio (2012).

NIT sees all types of individuals interacting within socially organized environments, which are guided by rules, regulations, norms, and definitions. Additionally, NIT concentrates on nonlocal environments and considers sector-wide points of view. Furthermore, NIT focuses on analyzing interorganizational interactions and formal structures of organizations (DiMaggio & Powell, 2000; Powell & DiMaggio, 2012). Taken together, this constructed environment constrains and shapes action. Individuals must conform to the rules, and behaviour is predicated on cultural and cognitive ways of learning— behaviours are attributed to the environment (Röbken, 2004).

I used NIT as my theoretical perspective for organizational change because it is informed by and aligned with the sociological view of institutions—functionalism—and how they shape the behaviour of actors. Although NIT describes how organizations tend to resist change, it is aligned with functionalism because of the shared values of equilibrium, order, and stability (Garner, 2019; Macionis & Gerber, 2010; Stepnisky, 2019). The challenge becomes how to view change from an NIT perspective to identify change drivers, analyze the PoP, and to articulate ways of assessing and monitoring any change efforts.

Organizational lenses. The critical analysis reveals that College X is constrained by three main models or organizational theories. The bureaucracy, collegium, and political models are organizational lenses that are grounded in a disciplinary foundation of sociology and are aligned with functionalism; they offer an integrated approach to analyze the PoP. Where the bureaucratic and collegium models fall short, the political model offers many insights about the true nature of sustainable MR institutionalization.

Bureaucracy. The bureaucratic model, originally described by Weber (1905), best explains the administrative behaviour and functional operationalization at College X; efficiency and depersonalization are enacted. Manning (2018) explained that elements of bureaucracies exist in every HEI, yet the model is an imperfect fit for the setting; authority, power, and responsibility are central to bureaucracies, which is a complicating factor considering that HEIs have democratic governance structures requiring faculty buy-in and extensive consultation. Manning argued that bureaucracies are effective in stable environments; HE is characterized by volatility.

Elements of the bureaucratic model contribute to understanding the PoP; bureaucracy is rooted in rational decision-making, standard operating procedures, hierarchical structure, and top-down leadership and communication (Katz & Kahn, 1978; Udy, 1959; Weber, 1905, 1978). If College X operated entirely in this domain, rationality would have already advanced MR institutionalization. Not having originated at the top, the idea of incorporating MR into classrooms has not—thus far—proceeded beyond one-time projects. As noted by Manning (2018), the bureaucratic model discourages innovation through the imposition of order, which offers insight into why MR institutionalization has failed.

Collegium. Another organizational model that offers insight into the nature of the PoP is the collegium model. Originally described by Clark (1963, 1980), the key characteristics are participative decision-making (Childers, 1981), consensus (Birnbaum & Edelson, 1991), expertise in discipline (Bowen & Tobin, 2015), and professionally situated power (Bowen & Tobin, 2015). Manning (2018) explained that this traditional model is threatened by academic capitalism because the corporatization of education serves to undermine the collegium's foundational values. Recent trends towards neoliberalism in HE erode power, authority, and legitimacy (Rhoades & Slaughter, 2004; Schrecker, 2010).

When applied to the PoP, this model explains the success of the innovation project, which relied on participative decision-making, action based on consensus, professional power, and faculty scope of influence and recognition from peers as a reward structure. This model also explains why the project failed to become institutionalized: the decision, action, power, and leadership would have to be enacted in the bureaucratic domain for that to occur.

While the bureaucracy model explains the administration domain and the collegium model explains the faculty domain, they are incomplete when it comes to understanding a path forward for the PoP at the institutional level. Although they are complementary, it is the interaction and relationship between them that requires understanding and explication. The political model helps understand the dynamics leading to failed MR institutionalization.

Political. The political model emerged because of weaknesses in the collegium and bureaucratic models (Baldridge, 1978); decisions are not made in isolation—context matters—and interpersonal relationships are foundational (Ellis, 2016). In the political model, decision-making is based on compromise and conflict, actions are based on loyalties and policy, and power is realized through charisma and influence (Morgan, 2006). Leadership through coalitions,

influence through relationships (Ellis, 2016; Manning, 2018), and the enactment of power (coercive, reward, legitimate, referent, and expert) and authority (Birnbaum & Edelson, 1989) is paramount to its efficacy.

In framing the PoP, the political model explains the lack of transition from integration to institutionalization. Advancement requires different skill sets that neither faculty nor administrators have mastered. Defined roles and responsibilities have set up both sets of participants to be ill equipped to help MR institutionalization.

The political model reveals four alternative barriers to MR institutionalization. According to Ellis (2016) the three barriers in the political model are prioritization, goal commitment, and people-goal connection. As applied to College X, these barriers are apparent. First, it is possible that innovation is in fact not a priority. Second, the project is innovative but not linked closely enough to other strategic goals. Third, there might not be a strong commitment to the goals from either end of administration or faculty. Last, there might be a mismatch between the right people and goal achievement.

Furthermore, Manning (2018) presented the notion of interest convergence, which arose out of Bell's (1980) seminal work and was further developed by Harper (2009) and conceptualized by Delgado and Stefancic (2012), whereby advancement of ideas benefitting others *only occurs when self-interests are also advanced*. Applied to my context, the political model informs me that failed MR institutionalization could be due to the lack of interest convergence. A small coalition of faculty, IT support, and administrators is simply not enough to achieve MR institutionalization. A perceived neutral decision—MR institutionalization—requires interest convergence to satiate the predominant group self-interest. MR institutionalization has the potential to advance other institutional goals such as increasing

registrations and diversity of students. Technology offers a promising way to enable a whole new subset of the student population—nontraditional and nonidealized students—to access and participate in HE. Recently, the advent of COVID-19 has suddenly brought the need, desire, and demand for educational technology tools such as MR to the fore. As an example of interest convergence, the institutional goal to help students complete the winter 2020 semester at College X has converged with educational technology advocacy, and the result is that faculty, administration, and students have been given pause to reflect and are rethinking traditional face-to-face learning delivery models.

Power and authority. Baldridge (1978) detailed the fragmented nature of power and authority within HE. The structure of HEIs distributes responsibilities among actors in a way that demands a political response to be effective. As such, no single actor has the power to solve problems and face uncertainty alone. Manning (2018) pointed out that environmental volatility provides the opportunity to increase power bases when innovative approaches prove successful (p. 166). One reason MR institutionalization fails is that administrators are threatened by the increase of power and authority actualized by the faculty who drive the projects. Careful consideration of power and authority are needed to advance projects to the sustainability stage.

Recent Theory

Contemporary research points to the importance of politically astute organizational leadership in HE. Given the modern challenges institutions currently face, Amey, Jessup-Anger, and Tingson-Gautz (2009) drew attention to the requirement for understanding the role of politics in decision-making in HE. Furthermore, Stringer (2009) asserted that effective leadership in HE requires integrating political principles into administration activities. For some, this can be a daunting task. Fortunately, Ellis (2016) clarified the role of politics in HE and has named

emerging considerations for political practice in HE that must be heeded to navigate the decision-making process involving digital transformation. Ellis highlighted seeking decision-making opportunities, cultivating good relationships, embracing conflict, harnessing the power of data, engaging in second-guessing, and practicing artful procrastination.

Instead of avoiding decisions or making bad decisions, Ellis (2016) encouraged seeking out opportunities to make decisions where people can hone their skills. Additionally, Ellis stressed that cultivating good relationships leads to good decisions—the use of power, rule, and authority will lead to effective decisions and leadership. In relation to conflict, harmony is to be avoided. Harmony discourages alternative perspectives worth considering during decision-making processes. Instead, Ellis suggested explicitly asking for disagreement, which gives platform for integrating innovative ideas and perspectives. Ellis's demand for data to drive decisions is not surprising; it supports objectivity, yet still allows for subjective interpretation that will inform decisions. Although debriefing has always been a terrific way to reflect, the suggestion to second-guess a decision can be intimidating because it requires courage and vulnerability. Ellis's call for debriefing is understandable; I am concerned about audience and question how it might undermine trust. Finally, Ellis called for artful procrastination, which is understood to mean avoiding the rush to decide. Timing is everything. It is important to consider how to trust a process rather than force a decision and to consider all the relevant information in a prompt fashion. Given the complex nature of contextual elements shaping digital transformation, consideration for recent political theory enacted is needed.

Political, Economic, Social, Technological, and Environmental Analysis

A brief political, economic, technological, and environmental (PESTE) analysis provides significant contextual evidence that advances understanding of the PoP and indicates potential areas to be addressed in the OIP.

Political: Global trends. Three key external trends related to neoliberalism have cumulatively led to the vision and need for MR institutionalization: The Fourth Industrial Revolution (Birt & Cowling, 2016; Schwab, 2017), a diversifying BC economy (Muir, 2016), and increased competition for tuition due to declining public funding (CAUT, 2015).

The rise of the Fourth Industrial Revolution (Birt & Cowling, 2016; Schwab, 2017) requires participants in the workforce to think more creatively and to embrace a design mindset. A design mindset is solution focused and action oriented, involving analysis and imagination (Spillane, 2009). As more jobs become automated, the demand for digital literacy skills emerges. Students and employers alike are looking to HEIs to address this new skills gap (Stuckey & Munro, 2015).

At the provincial level there has been a noted shift in BC away from a natural resource–based economy. Where once many high school graduates could earn a decent living without any postsecondary education, the shift has forced many to seek postsecondary education to qualify for jobs elsewhere—namely, the technology sector (Muir, 2016). Furthermore, the shift has created new opportunities that require even higher education levels.

The third external pressure identified is the competition for students—and thus tuition revenue—in the face of significantly declining public funding for HE over the last 20 years (CAUT, 2015). As tuition fees increase, students behave more like consumers; HEIs become commodities to be compared and scrutinized for quality, value, outcome, and cost (Olssen &

Peters, 2005). Consequently, HEIs are differentiating and marketing themselves more aggressively. Evidence of the influences of neoliberalism on HE includes the creation of the Emerging Media Lab at the University of British Columbia, as well as the construction of the Technology Health Sciences Centre for Advanced Simulation at the British Columbia Institute of Technology. HEIs are responding to what Barnett (2000) described as the concept of performativity; HEIs are marketing and commodifying teaching and research to meet new measurable outputs—employment. As such, College X risks losing legitimacy and stands to experience significant setbacks if MR institutionalization fails.

Political: Internal and institutional policies. In response to the global trends discussed, high-level policies at both the internal institutional level as well as the external governmental level have been created. The theme of innovation, which emerges repeatedly throughout policies, includes MR institutionalization.

At a prominent level, innovation is supported explicitly in the strategic plan for College X (2016) as well as the Information and Technology Services department (College X, 2015). Furthermore, faculty digital literacy skills are supported through the Centre for Excellence in Teaching and Learning (College X, 2018a) and adopting technology is incentivized through the Creativity and Innovation Awards (College X, 2018b). While the strategic plan focuses on how innovation will serve external future challenges, Information and Technology Services supports internal functionality, the Centre for Excellence in Teaching and Learning emphasizes andragogy, and the Creativity and Innovation Awards are temporary and therefore not fiscally sustainable. A coordinated, articulated, and sustainable digital transformation plan that works towards MR institutionalization at the organizational and administrative, functional, and IT levels, as well as the andragogical and faculty levels, is lacking.

Economic: External and governmental policies. There are some particularly important external governmental policies and agencies that address innovation—and thus MR institutionalization in HE—directly. Despite the fact that the BC Innovation Council (2018); the Premier's Technology Council (2018); the Digital Supercluster (2018); the BC Ministry of Advanced Education, Skills and Training's (2018) service plan; and the Government of BC's (2018) jobs plan originate from different levels of government and portfolios, each articulates the importance of leveraging technology and moving innovation forward. Whereas the Premier's Technology Council provides strategic recommendations to grow the technology sector in BC, the BC Innovation Council seeks to develop ways to apply innovative technologies to existing problems. Additionally, the Ministry of Advanced Education, Skills and Training and the BC jobs plan both endeavour to prepare learners for an emerging technology-based economy by providing high-quality education and training that is punctuated by creative and innovative learning, which is widely come to be known as digital literacy.

Nationally, the federal government recently announced the creation of Canada's Digital Technology Supercluster, which is expected to see a $1.4-billion investment grow into a GDP growth of $15billion GDP over 10 years. The Supercluster is a consortium of world-leading companies partnering with start-ups, small and medium-sized enterprises, and researchers and students in HEIs working towards solving the most important global challenges in the realms of health, sustainability, and productivity (Digital Supercluster, 2018). The goal is to propel Canada and BC to become world leaders in the digital technology economy, which is portrayed as a sustainable economic advantage.

Evidence of high-level, coordinated efforts to support the supply and demand of digital literacy skills abound. Policies aim to address the global trends identified by reforming education

towards technology-leveraged domains and inspiring a new way of thinking. Employers are demanding these skills, and by aligning the education side of the equation with employer needs, the strategy seems to be to move away from natural resource–dependent economies, towards more sustainable knowledge-based models. These policies are high level and lack discrete plans for execution. Clearly there is a need to create an OIP that bridges the divide between high-level visions and institutional goals.

Relevant Internal Data

Becker et al. (2018) identified trends, challenges, and developments in HE technology. Among those listed, the PoP for this study explicitly deals with the trend of advancing innovation, the challenge of improving digital literacy, and the development of MR. Not only does Becker et al. (2018) add credence to the heightened need for College X to address this trend, challenge, and development, but it also highlights the importance of data.

Kennedy (2019) aptly recognized the vital role of data to advance innovation, improve digital literacy, and to develop MR in HE. Data is inextricable from political decision-making processes in HE and must be integrated into any digital transformation plan. However, no internal data about improving digital literacy and MR has been found. While reasons for the dearth of data could be surmised, the reality remains: No internal data exists. Unlike other explicit data such as enrollment or completion rates, the institutionalization of MR as a technology is not being assessed or evaluated.

Relevant External Data

Kennedy (2019) highlighted the importance of predictive data in helping HEIs understand what will happen in the future. Predictive data allows institutions to prepare for a changing landscape before it happens. Given the complex nature of modern challenges facing

HEIs, external data forms a key component to strategize institutional direction and to inform decisions that best situate an institution for sustainability and success. Due to the very birth and nature of digital transformation and institutionalization of MR, there is little external descriptive data that explicates what has happened in the past. Instead, because this is a forward-looking endeavour, predictive data is required to drive institutional decision-making. A discussion of Figures 1, 2, and 3 reveals the direction MR is headed.

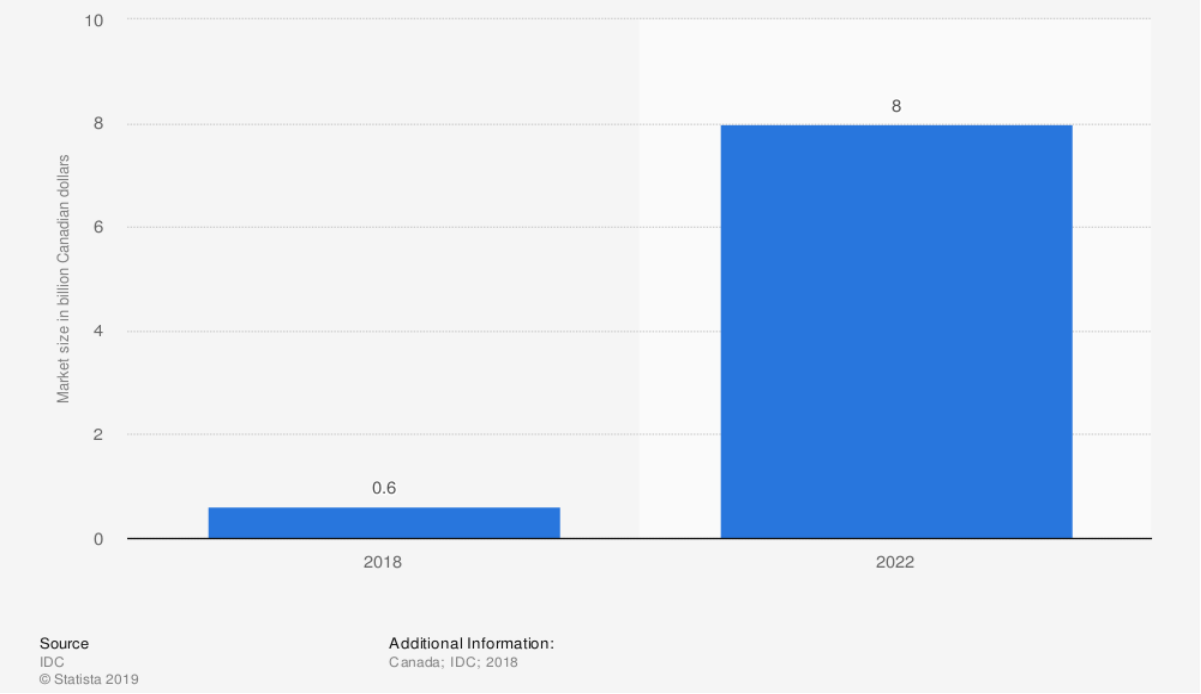

Figure 1. Forecasted Canadian mixed reality market size. From "Forecast Augmented (AR) and Virtual Reality (VR) Market Size in Canada in 2018 and 2022," by Statista, 2019a (https://www.statista.com/statistics/866903/canada-augmented-virtual-reality-market-size). Copyright 2019 by Statista. Reprinted with permission.

Figure 1 shows a forecast for the Canadian AR and VR market size for 2018 and 2022. In 2022, the Canadian AR and VR market is expected to reach a size of 8 billion US dollars (International Data Corporation, 2018). In the brief period of 4 years, the overall market in Canada is expected to grow over 10 times as large. For the sake of comparison to a traditional,

established, consumer-driven market, this places the MR market on par with the Canadian jewelry market, which is valued at $8 billion (Bedford, 2019).

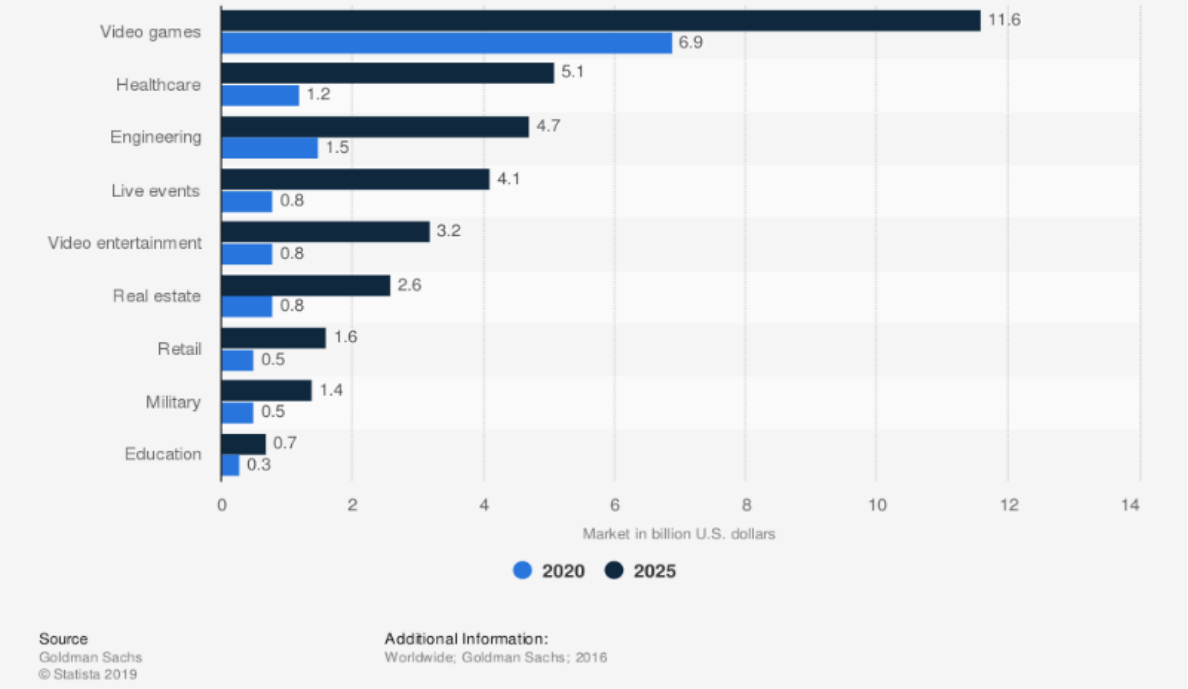

Figure 2. Forecast worldwide MR market size. From "Forecast Size of the Augmented and Virtual Reality (VR/AR) Market Worldwide in 2020 and 2025, by Segment," by Statista, 2019b (https://www.statista.com/statistics/610112/worldwide-forecast-augmented-and-mixed-reality-software-market-by-segment). Copyright 2019 by Statista. Reprinted with permission.

Not all industries are growing, however. In fact, some remain stagnant, while others shrink. Considering both absolute and relative market size, MR is an emerging giant in Canada. In view of the substantive outlook for the sector then, it becomes important to consider which subsectors will grow the most, because these areas represent the largest opportunities for education to address future demands for employment skills.

Figure 2 shows that healthcare and engineering represent two of the biggest MR sectors, apart from video games, that are expected to experience significant growth (Bellini et al., 2016). The importance is that the rate of embeddedness within sectors will be significant; students

graduating from College X will inevitably encounter MR technology in practice. They will be better prepared for the workplace if they acquire digital literacy skills specific to MR in preparation for the workplace. Although College X does not currently offer credentials in all these areas, several of the college's programs fall into the top two identified sectors: healthcare and engineering. Given the forecast, the time to act is now. From an NIT perspective, it will become imperative to maintain institutional legitimacy by paying heed to the anticipated growth and aligning educational delivery models and curricula with the skills employers will demand, thereby empowering learners to thrive in the face of the Fourth Industrial Revolution.

Although there might be resistance to MR in education, external data provides further evidence that the absolute number of users is increasing with a breathtaking uptake. Figure 3 depicts the forecast user base of MR software, by segment or use case, in 2020 and 2025. By 2025 it is predicted that AR and VR software for video games will have 216 million users worldwide and be worth 11.6 billion US dollars (Bellini et al., 2016). The place of MR technology in the education field it is expected to more than double from seven million users to over 15 million users just within the next 5 years. Referring to DIT then, it is not surprising that the prevalence of MR technology in the overall public realm is expanding with voracity. This is a clear sign of mass adoption and integration in the public realm. Moving forward, this data presents a paradox for College X. An expanding user base worldwide is both an opportunity and a threat. The opportunity is to meet the demand and to capitalize on an emerging trend; the threat is that the digital transformation is advancing and growing so rapidly that institutional legitimacy is threatened if the college does not act. In such a case, the gaps between what College X offers, what employers demand, and what students look for will widen to the point that College X will no longer be relevant.

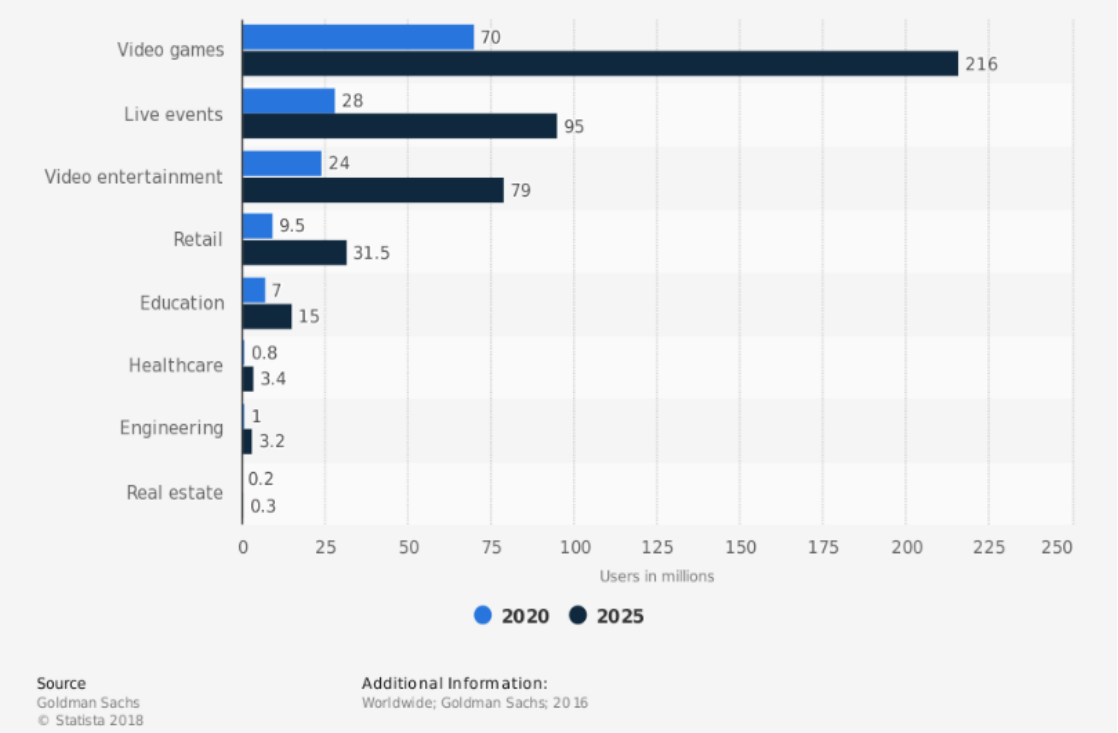

Figure 3. Forecasted MR user base worldwide. From "Forecast User Base of the Augmented and Virtual (VR) Software Market Worldwide in 2020 and 2025, by Segment," by Statista, 2018 (https://www.statista.com/statistics/610126/worldwide-forecast-augmented-and-mixed-reality-software-users-by-segment/). Copyright 2018 by Statista. Reprinted with permission.

Given the issues discussed in Chapter 1, guiding questions emerge that allow for a robust OIP. The next section discusses these guiding questions.

Guiding Questions Emerging from the Problem of Practice

Several lines of inquiry emerge from the PoP that must be addressed to generate an effective and efficient plan for digital transformation and institutionalization of MR. The first question that arises is based on the functionalism notion of equilibrium: Given that change is inevitable and required, in what ways can institutional equilibrium be nurtured and maintained? Environmental cues indicate that the institution *needs* to change. The strategic plan signals that the institution *wants* to change. The current politics play a role in preventing ground-level initiatives to transition to sustainable institutionalization. Given that change efforts threaten

institutional equilibrium, it becomes clear that both equilibrium and change must be concurrently addressed. To this end, collaboration, consultation, and leadership must be enacted across multiple political arenas.

The second question that arises from this complex PoP is as follows: In what ways can technology leadership be enacted? One important aspect of the institutional context under investigation is the growing demand for quality, relevance, accountability, efficiency, and responsiveness. College X must address these demands to survive and to maintain relevance and credibility. As Bullen (2014) noted, technology in learning is not the magic bullet that will solve these growing demands, but it can play a significant role if dealt with strategically. Bullen's arguments support the PoP in that he called for incorporation of technology into core operations, aligning it with strategic plans, as well as developing a specific strategic plan for learning technology. Bullen agreed with Bates and Sangra (2011), who pointed out that HEIs need to be innovative in the face of declining funding. This is a reliable source that is professionally researched and linked to a growing body of work that focuses on sustainability of technology leadership in HE. There is a clear need at College X to address the contextual pressures and to lead the technological sustainability of MR institutionalization.

The third question that becomes apparent is based on the discovery that internal data on the institutionalization of MR is nonexistent: What questions need to be included in an internal data collection process in support of the institutionalization of MR? As part of evidence-based practice, the need for data to drive decisions has been discussed. Without internal data any efforts that try to move institutionalization of MR forward will fail before they begin due to a lack of internal data. Knowing that predictive external data is accessible and will coincide with a descriptive situational data collection process internally that is currently nonexistent, advancing

digital transformation and institutionalization of MR will be hindered without internally generated empirical evidence that can be relied upon as a baseline for administrative decisions.

In the next section, the previously discussed background information is brought into focus through a description of a leadership-focused vision for change that addresses contextual nuance at College X.

Leadership-Focused Vision for Change

HEIs in Canada are operating within a context of New Public Management (Pollanen, 2016), decreased government funding (Parker, 2013), and a shift in the way they are governed (Capano, 2011). College X is not immune to these forces, yet it has responded appropriately in most ways to remain operationally sustainable. What remains are specific opportunities to address underdeveloped strategic directions, maximize internal resources, and build upon meeting the socioeconomic needs of the greater community. A clear leadership-focused vision for change provides the foundation for an effective change management plan.

Present versus Future State

Geiger (2004) pointed out that in the modern economy—characterized by high competition, global reach, and a knowledge base—technological solutions are fundamental to economic development. For HEIs, as their funding resources diminish, government demands increase through a steering from a distance model (Campano, 2011). In addition, tuition caps and programming restrictions are imposed; for an institution the logical solution is to seek internal efficiencies in all forms, including the way in which students learn.

Within College X are some elements of the steering from a distance model of governance discussed by Capano (2011). The BC government links HE funding to the needs of the economy through the provincial jobs plan (Government of British Columbia, 2018). Those fields

considered in the greatest need of workers are prioritized. This creates winners and losers within College X. The School of Trades and the School of Health and Human Services each have new state-of-the-art training facilities as well as increased funding for expanded enrollment. Arts and social sciences have not fared so well. The goals of increasing skilled labour for construction and healthcare industries have been prioritized. However, innovation is a significant blind spot in the strategic plan with the potential to advance internal efficiencies and transform the way students learn through advancing MR institutionalization.

Despite significant macro-, meso- and microfactors positively contributing to the digital transformation and advancement of MR institutionalization, it remains important to also consider their alignment. The creation of the Digital Supercluster (macro), employer and learner demand for digital literacy skills (macro), strategic goals of innovation and creativity (meso), MR simulation space allocation (meso), acquisition of required hardware through the President's Innovation Fund (micro), and successful andragogy integration (micro) are all significantly positive situational advancements. The future state is clearly predicated on a digital reality; stakeholders are aware of the need for digital literacy skills—green shoots are visible (Adams Becker, Pasquini, & Zentner, 2017; Whitehead & Quinlan, 2002). What remains is the clear need for a plan to help digitally transform College X and work towards MR institutionalization.

Drawing upon the digital transformation research by Miller (2019), I have identified four priorities that will help advance the innovation agenda and improve the likeliness of digital transformation success at College X. The vision for change focuses on internal data collection, digital equity, expertise capacity, and effective hierarchical communication.

Priority 1: Internal Data Collection

Current state. As previously identified, no internal data on MR institutionalization exists at College X. Despite well-articulated goals in the strategic plan (College X, 2016), no data is available that would substantiate efforts in this regard.

Relevant theory. The importance of data for digital transformation in HE is well documented (Gagliardi, Parnell, & Carpenter-Hubin, 2018; Kennedy, 2019). Kennedy (2019) discussed the issue of the democratization of data and surmised that data governance is more important than technology itself. The democratization of data is understood to mean that informed and educated stakeholders have an improved ability to make good decisions about the use of technology (Kennedy, 2019).

Future state. A future state for internal data collection at College X is built upon research-based recommendations and suggestions articulated by Kennedy (2019). Though not all recommendations are viable or relevant, their likelihood of success is within the realm of possibility and the purpose of some of the suggestions is clear. Kennedy recommended asking the right questions, starting small and scaling up, and ensuring senior leadership buy-in. Clearly including these parameters as part of an internal data collection initiative will improve chances of success.

Priority 2: Digital Equity

Current state. Presently, College X has a sporadic IT infrastructure deployment strategy. At one end of the spectrum, some classrooms have no computers available for students; at the other extreme, some classrooms have a computer available at every seat. Although not directly related to MR hardware, this situation provides insight into how IT deployment at my institution is not anchored in any overarching, articulated strategic value such as equity. As it relates

specifically to MR hardware, the situation is far less ideal. Deployment of MR hardware is driven by a faculty member's ability to access the resources. The technology is not widely available or accessible. Although this situation could be characterized as chaotic, therein lies opportunity to create a digital equity plan for access to MR hardware.

Relevant theory. Paulsen (2001) discussed the notion of inefficiency in HE due to some human resources not being developed to their fullest potential. Although Paulsen was referring to the impact of socioeconomic status (SES) on access to HE, this notion can also be extended to consider access to technology—MR hardware. College X has an articulated commitment to social justice with roots in distributive justice (Forsyth, 2006), which describes the socially just allocation of resources. The college has a duty and responsibility to provide the technological skills to *all* learners and to introduce them to these platforms through curricula. Paulsen discussed the notion of vertical and horizontal equity as a criterion for evaluating the allocation of resources. Table 1 draws on the distributive justice notions of inequality, equality, vertical equity, and horizontal equity. Additionally, it shows policy intervention results and a comparison of circumstances versus treatments.

Table 1

Policy Intervention Results: Comparison of Circumstances Versus Treatments

Circumstances	Treatments	
	Similar	Dissimilar
Similar	Horizontal (Equity)	Inequality
Dissimilar	Equality	Vertical (Equity)

Table 1 shows how similar and dissimilar circumstances and treatments demand alternative policy interventions. Further, diverse student populations with various SESs will realize the benefit of any initiative uniquely. Students at the low end of the SES spectrum will be affected more than those from the high end of the SES spectrum.

Future state. Deployment of MR hardware needs to be carefully considered and follow a research-informed approach that aligns with institutional priorities. In a class with Wi-Fi connectivity, students with high SES bring devices and engage dynamically with content during lectures. Otieno (2015) found that digitally enabled learners achieved higher levels of academic success, and Staples, Chandler, and Lowe (2018) specified that iPad-enabled learning is associated with more efficient and effective communication, collaboration, engagement, and learning. To this extent, students without devices risk missing out; they are receiving a less engaged education. This "digital divide" is prevalent in Canadian HEIs (Goff & Ahmad, 2015). It affects minority ethnic and language groups, as well as Indigenous, rural, remote, and low SES populations disproportionately (Attewell, 2001; Looker & Thiessen, 2003; Natriello, 2001; Rideout, 2000; Reddick, 2000). This is inefficient and inequitable. If College X supplied devices to all learners, regardless of SES or background, all students would have the same opportunities. This is efficient *and* equitable: It would increase efficiency by developing the human resource potential of *all* students and it would provide the opportunity to *all* students regardless of SES, thus increasing equitability and narrowing the digital divide almost entirely.

Moreover, in referring to Table 1, I fully recognize that the input of the SES of students cannot be controlled—College X will always be dealing with students from disparate backgrounds (Forsyth, 2006; Goff & Ahmad, 2015; Paulsen, 2001). Neither a horizontal equity nor an inequality approach can logically be taken, leaving two options: equality or vertical equity.

As it applies to resource allocation (Forsyth, 2006), a vertical equity response would mean only providing the technological innovation implementation to students with low SES, and providing minimal support to higher SES students because they will buy their own devices. This

approach is highly problematic within College X and would cause divisiveness. This postmodern approach is not aligned with my context. An equality approach (Forsyth, 2006; Goff & Ahmad, 2015; Paulsen, 2001) should be advanced, where all participants are provided the same or similar allocation of opportunity through technological innovation and implementation of educational opportunities.

Priority 3: Expertise Capacity

Current state. MR use is primarily found in the video game industry, so there is only limited expertise on the part of educators. Moreover, the digital literacy skills required to use the technology effectively and efficiently are largely self-taught and experiential in nature. MR as a tool is so new that there is a relative dearth of literature to rely upon for faculty members interested in incorporating MR technology into their andragogy. At College X, a small group of early adopters—fewer than 12 faculty members—have experimented with MR technology as part of their andragogy.

Relevant theory. As with any innovative technology, it will take a while for research-informed andragogy to disseminate among educators. In fact, only recently has a conceptual framework for the integration of MR as an educational tool been articulated (Kommetter & Ebner, 2019). Although this paper is a literature review pulled from a wide array of fields of study, it represents a brave new beginning in that it tries to connect the tool with education theory. Furthermore, the paper is an important call for further scholarship in the field based on collaboration, engagement, and critical reflection.

Future state. Heeding the call for building expertise capacity, the future state at College X includes personal development of MR skills and proficiency, peer mentoring for MR skills,

critical reflection on the relationship of MR technology and andragogy, and publication of articles and contribution to the leading-edge work of integrating MR technology with andragogy.

Priority 4: Effective Hierarchical Communication

Current state. The present communication pattern at College X usually follows the organizational chart. Issues are escalated based on urgency and responsibility for action. As discussed earlier, College X operates as a role culture. Informal conversations are always welcome, and the president and dean embody openness to ideas. Access to senior leadership is often constrained by availability; time is a resource. Nevertheless, I have cultivated a mutually beneficial, informal, unstructured, and less visible relationship with College X's president. Where traditional hierarchies and ways of governing have been both slow, as well as restrictive, my ability to enact personal leadership based on AL and DL has built trust and cultivated informal relationships. Communicating effectively and efficiently on an interpersonal level has influenced the president to support my technological innovation work.

Relevant theory. Austin and Jones (2016) stated that explicit hierarchies for decision-making are vital. With due respect, my personal MR advancements have not always been successful following this traditional path. The most significant advancements (i.e., hardware acquisitions) have been due to what Austin and Jones also recognized: the influence of invisible and alternative governance structures. Simply put, acquisitions by strategic connections.

Future state. Efficient and effective communication is paramount to advancing issues; political acumen is needed. Listening to the needs of senior leadership will better inform possible paths forward, especially when it comes to aligning efforts, resources, and strategy. Informal technology leadership will be best solidified through continual efforts to provide feedback to senior leadership about digital transformation and MR institutionalization efforts.

Priorities for Change

Sustainable technology institutionalization and digital transformation require strategic navigation of the interface between bottom-up and top-down initiatives. Keeping in mind significant large-scale institutionalization does not take place overnight, priorities and goals are strategic choices that can be scaled up and are envisioned to evolve. Additionally, they address the previously discussed gaps and are aligned with the desired future states.

Goal 1: Collect internal data on MR institutionalization. College X operates as a hierarchical bureaucracy with an entrenched role culture. Explicitly, decisions are made throughout College X touting evidence-based practice. The purpose of evidence-based practice is to improve the efficiency and effectiveness of policy decisions (Head, 2010) within College X, and to help all stakeholders understand the rationale for decisions. One of the primary requirements for evidence-based practice is good data (Head, 2010). To this end, internal data needs to be collected by institutional researchers in order to help inform senior leadership about MR institutionalization decisions. The strategic vision will only be validated if reliable data is available to assess progress. To this end, the priority is to be an advocate for data collection and work with institutional researchers in order to develop an acceptable method to collect this information. The calculated cost is approximately $2,000 to complete based on two people working for a one-week full-time equivalent. This cost is already embedded in existing salary structures.

Goal 2: Establish digital equity. The digital divide (Attewell, 2001) refers to differential access to technology based on SES, race, language, gender, geography, or cultural background. Soloman, Allen, and Resta (2003) described efforts to reduce or erase differential access to technology in education as digital equity. Two primary barriers to digital equity have been

identified by Attewell (2001): technology availability and technology use. Although the benefits of technology to help improve efficiency and effectiveness in teaching and learning are not new (Maginnis, White, & McKenna, 2000), the importance of aligning access to technology at College X with the broader systemic policy of institutional equity becomes paramount.

In support of digital equity, building upon adoption and integration of MR within my personal andragogy is prioritized, which can be used as a point of leverage to articulate and propose a plan for digital equity within my classroom. I will write a proposal that advocates for MR-enabled iPads within my program. Students will benefit by having access to an efficient and equal education that provides them with advanced digital literacy skills. The calculated cost would be approximately $40,000 based on 30 iPads loaded with proper software. This is a new cost.

Goal 3: Build expertise capacity. The digital literacy framework of BC promotes the interest, attitude, and abilities of individuals to use digital technologies in education, emphasizing personal and social connections. Furthermore, efforts to share knowledge are beneficial to the digital transformation of HEIs (Alexander, Becker, Cummins, & Gesinger, 2017). To this end, the goal is to showcase the integration of MR technology into andragogy. The new social stairs and big screen available at the main entrance of the new building at College X is a great fit to host a discussion forum for students, faculty, and senior leadership. Organizing this event requires some planning and coordination, but it is well within reach, and especially impactful given the potential for high-traffic exposure. This will allow for dissemination of technical expertise and serve as inspiration for future efforts. The calculated cost is approximately $4,000 based on the time commitment required to plan and execute this activity. This cost is already embedded in existing salary structures.

Goal 4: Enhance hierarchal communication. In order to increase the dialogue and understanding about MR technology institutionalization, effective, undiluted communication needs to transcend hierarchal roles. It has been previously established that both informal and formal communication that transcends bureaucratic hierarchy raises awareness, cultivates interpersonal relationships, and builds trust (Kezar & Eckel, 2002; Tierney, 1988). Although time is a constrained resource, the goal will be to increase the frequency of communication with senior leadership, report positive experiences and successes, and listen for feedback about how technology leadership can be enhanced in order to align institutional priorities with MR efforts. This has a moderate cost associated with it: The time required to send an email or tweet or talk in passing is small; face-to-face meetings increase the cost, yet promise to nurture relationships. Increasing formalized reports will require 1 hour a month; annualized, this expense would cost $600 and is already embedded within existing salary structures. Setting up committee meetings would add another $5,400 to address this goal.

Change Drivers

Salmon (2019) argued that HEIs are partners in preparing students not only for employment but also as creative thinkers that will need to leverage technology and innovative new tools to solve complex problems of the future—problems that are unlike any seen before. Although much of the focus of the vision for change is internal, there are external change drivers that can also be leveraged in order to help advance the urgency required to stimulate changes at College X.

NIT supports the notion that organizations will seek efficiency and that nonlocal environments impact organizational action (Salmon, 2019). In applying this to College X, some of the change drivers identified are external to the institution, and yet they hold potential to

pressure the college to seek legitimacy, and hence MR institutionalization. They include professional bodies, accreditation or standards assessors, employers, and students. Professional bodies inform curricula; modernized competency profiles are starting to mention digital literacy skills. Accreditation standards legitimize the qualification awarded; a move towards digital literacy skills would require action to conform. Employers continuously seek to differentiate themselves in a competitive market; savvy employers who are technologically inclined now demand graduates with digital literacy skills. Students are seeking value for money given increasing tuition; one way that they evaluate relevancy of a credential is if it reflects the digital reality they live in (Sheninger, 2019). Students will choose programs and HEIs that offer digital literacy skills embedded in curricula over institutions that do not.

Organizational Change Readiness

Cawsey, Deszca, and Ingols (2020) identified several key factors that affect an institution's ability to adapt to change in the face of internal and external environmental factors. It is not surprising to read that earlier experiences with change efforts, various levels of support from senior leadership, credibility of change agents, reward for effort, and accountability measures all have a role to play when it comes to organizational change. It becomes vital then to assess and evaluate College X's readiness for change as it pertains to digital transformation and MR institutionalization.

A closer look at the readiness of the stakeholders involved reveals a promising fertile landscape for MR institutionalization. An analysis of stakeholder readiness is shown in Table 2, which is framed by my personal locus.

Table 2

Stakeholders' Readiness for Change

Stakeholder	Commitment (Resistor, Neutral, Supporter, Committed)	Willingness to Change (Innovator, early adopter, early majority, late majority, laggard)	Change Spectrum			
			Awareness	Interest	Desires Change	Takes Action
Myself	Committed	Innovator	X	X	X	X
Department faculty	Committed	Early adopter	X	X	X	
Institution-wide faculty	Neutral	Late adopter	X	X		
Department chair	Neutral	Late majority	X			
Dean	Supporter	Early majority	X	X	X	
President	Supporter	Early majority	X	X	X	X
IT department	Neutral	Late majority	X			
Students	Supporter	Early adopter	X	X	X	
Employers	Supporter	Early majority	X	X	X	
Community	Supporter	Late adopter		X		

Adapted from *Organizational Change: An Action-oriented Toolkit*, by T. F. Cawsey, G. Deszca, and C. Ingols, 2020. Thousand Oaks, CA: SAGE. IT = information technology.

On many accounts, there is evidence throughout College X that indicates readiness for MR institutionalization. Directly from the top, there are high-level, explicit strategies and priorities that support digital transformation and are aligned with MR institutionalization. Efforts from the bottom up have been encouraged and supported with resources. What remains is a need for technological leadership to coordinate faculty efforts and administrative strategies. Ultimately, successful MR institutionalization requires a skill set that neither senior leadership nor faculty possess alone. Successful change management in this regard requires a distinct readiness and willingness on the part of all stakeholders involved.

Internal Forces

Complex pressures exist within College X that will affect MR institutionalization. There are both high-level and grassroots-level readiness for change. The strategic plan (College X, 2016), vision (College X, 2011), and President's Innovation Awards all represent significant explicit and articulated support for digital transformation. The persisting impact is that almost all

stakeholders are aware and also interested in MR institutionalization. This is extremely encouraging, especially since grassroot efforts also have the same goal.

Despite a clear and palpable awareness and interest, there is also clear resistance. Although it is not necessarily apparent, the desire for true change is lacking, and action is almost nonexistent. My experience and reflection on this matter reveals that constrained resources, other competing strategies, and the relative early stage of the technology are working against the ability to advance MR institutionalization past small-scale adoption and integration, regardless of the positive impact. Chapter 2 addresses this gap.

External Forces

It is well known and highlighted in the strategic plan (College X, 2016) that College X thrives due to its close relationship with the local community. The mutually beneficial relationship is predicated upon responsiveness to the needs of the local economy as it pertains to providing education and credentials to support socioeconomic enfranchisement. Despite some effort to communicate with the community, awareness of MR activities is almost nonexistent. In fact, awareness is most likely limited to the students engaged in MR activities and their families through word of mouth. In this sense, although students might want MR-based education, the broader community is unable to support something that they do not even know exists. Communication and broader engagement will be required to garner support externally.

From a sectorial perspective, some employers are aware of MR-based education because it is already part of their daily activities. Other sectors are resistant and have no interest at all. It is important to identify those sectors resistant to change, as they will need to be convinced of the benefits or completely ignored because no amount of effort will overcome their resistance.

Sectors where external support exists are the most promising and will prove to be valuable allies when it comes to seeking political pressure for the advancement of MR-based education.

Chapter 1 Summary

This chapter addressed the PoP and presented several situational elements that provide context to understand the dynamics at play. College X is well positioned to respond to the diverse pressures to innovate and sustainably institutionalize MR technology in a digital transformation, yet several barriers exist. The contested middle ground between administration and faculty was identified as the area requiring a well-thought-out plan to lead the advancement of MR technology in a sustainable fashion. An organizational gap analysis gave rise to four viable goals: Collect internal data on MR institutionalization, establish digital equity, build expertise capacity, and enhance hierarchal communication. The next chapter explains my leadership approach to change and presents a conceptual model that considers relevant theory. Moreover, viable solutions are discussed.

CHAPTER 2: PLANNING AND DEVELOPMENT

The focus of Chapter 2 is articulating my leadership approach to change along with developing a framework to lead the change process. The PoP—lack of sustainability—is addressed by an OIP that aims to digitally transform College X through MR institutionalization.

Leadership Approaches to Change

My leadership approach draws upon AL and DL theory. My leadership approach needs to be aligned with the prevailing institutional context—namely, the role culture associated with hierarchical bureaucracy discussed in Chapter 1. The path towards sustainable technology institutionalization requires working within the existing organizational setting to accentuate and enhance the inherent strengths and to prepare for resistance from known barriers. Power must be accessed and enacted through leveraging coalitions and relational capacity. The primary goal is to derive informal leadership through advocating for the creation of an ad hoc sustainable technology institutionalization committee. AL and DL will be relied upon to be an effective and efficient contributor in this task culture endeavour. The following section reveals how DL and AL can be used to achieve my goal.

Distributed Leadership

As applied to my leadership vision for change, the DL principles discussed here are formal and informal, planned and emergent, and collaborative networks. These principles become infinitely important because they can threaten as well as reinforce hierarchies in HE. Central to the situational bureaucratic construct is the notion of power, which is inextricably linked to hindering or abetting organizational change (Murphy, 2009). This section names the barriers that may arise and articulates and critiques the potential power issues. Furthermore, the critical requirement for activating the underlying task culture that exists within a predominant

role culture at College X is discussed. Enhancing the underlying task culture will be key to allowing personal leadership to be enacted.

Distributed leadership enacted. DL emerged from the work of Edwin Hutchins (1995), who asserted that cognition is distributed in the social setting of an organization. Barbara Rogoff (1995) introduced the notion of interdependence between the individual and the organization and that leadership as enacted occurs on multiple levels. Further refinement of DL was articulated by Spillane (2006), who brought the concept into the realm of education. Modern understanding of DL is characterized by sharing responsibilities or functions of leadership among a team within an organization (Gronn, 2008). Institutional stability, communication across roles, and task routinization are needed for effective enactment of DL (English, 2007).

Chapter 1 revealed that a task culture exists at College X for smaller projects. In this context, as Mulder (2018) pointed out, expertise is valued, power is distributed, creativity is paramount, and results or outcomes are the goal.

In a task culture DL is paramount to sharing expertise and allowing access to knowledge beyond the scope defined by established roles within the organization. Trust is gained through vulnerability, efficiency is achieved through distributed contributions, and effectiveness is realized through communication (Tam, 1999). Although DL is not suitable when organizations are facing a crisis, it is well suited for planned change (Nyirongo, 2009); in pursuit of sustainable technology institutionalization, DL thus presents an optimal means for maximizing the strength of a diverse team, provided the focus is on the outcome.

In my context, MR expertise will be a conduit to open communication channels, nurture relationships, and exert influence to bring about sustainable technology institutionalization. Lumby (2019) warned about the barriers to DL in the bureaucratic setting of HE, chiefly the

notion of power and the threat of DL to hierarchies. Applying Lumby's notions of formality, planning, and collaborative networks, the challenge will be to leverage DL to move from the informal to the formal, from emergent to planning, and to enhance collaborative networks. Overcoming hierarchical resistance will require a focus on communication strategies that reinforce the urgency for change and support through access to resources. In my context, DL requires admission to a limited understanding of administrative work and demonstration of vulnerabilities, key being the need to ask for help. Contributions in a committee setting from well-situated members will bring about efficient action. In order to be effective, administrative needs will need to be met, and reporting successes will validate the process. Taken together, DL will allow for a shift towards formality, planning, and enhanced collaborative networks. However, DL alone will not advance digital transformation.

Authentic Leadership

Further advancing my leadership approach to change, and complementing DL, is AL. This section discusses the strengths of AL, specifically how they can be enacted to help leverage existing relationships with an eye to further supporting an underlying task culture.

Authentic leadership enacted. AL is a novel approach to leadership that requires relational ability predicated on trust and honesty. It was originally conceptualized by Henderson and Hoy (1983) and elaborated by Bhindi and Duigan (1997). Begley (2001, 2004, 2006) further expanded on the notions of authenticity, intentionality, spirituality, and sensibility. Recent work has focused on legitimacy, which is gained through the enactment of an ethical approach to valuing the input of followers ahead of any personal gain (Gardner et al., 2011). Four distinct qualities that must be embodied by an authentic leader include self-awareness, relational transparency, balanced processing, and internal moral perspective (Walumbwa, Avolio, Gardner,

Wernsing, & Peterson, 2008). Self-awareness refers to the ability of leaders to know their strengths, weaknesses, and core beliefs. Relational transparency refers to an ability to openly communicate beliefs and to minimize inappropriate emotions. Balanced processing refers to the leader's ability to consider diverse opinions and thoughts. Internalized moral perspective refers to the leader's ability to maintain a strong ethical and moral foundation in the face of corrupting pressure (Northouse, 2019).

Dark side of AL. Despite much of the appeal to foundational elements of AL, the approach is not without flaw. Recent critique has revealed significant issues about the dark side of AL. Foremost is the issue of complete authenticity, or the problematic representation of the "truest self" (Ford & Harding, 2011). Although AL supports transparency, conflict arises when leadership or character flaws appear—if they are hidden, AL is not enacted, but if they are displayed transparently, negative consequences have potential to emerge (Ford & Harding, 2011). It thus becomes detrimental to an organization if personal characteristics of a leader are enacted all the time. Relying on balanced processing, Stark and Flaherty (2010) suggested that considering two key things should help alleviate negative consequences of negative transparency. First, they suggested figuring out what the team needs from a leader right now, and second, they recommended deciding what would be gained by sharing the negativity. If the team needs positivity and there is not anything to gain by being negatively transparent, self-regulation is needed (Stark & Flaherty, 2010). Leadership focus should be redirected to positive elements that the team needs, with negativity minimized.

Task culture context. Considering the task culture recognized at College X, the role that AL could play within this environment assumes greater relevance. It is widely known that in a task culture AL is paramount to creating a creative and innovative environment. Whereas other

leadership theories are prescriptive, AL is descriptive and allows for personalization and situational development within the organizational context. As McBride (2010) pointed out, AL demands that modelling through direct involvement and action be enacted to build trust and respect, as well as provide support during periods of change. Meaningful change in HE is more effectively enacted by academic leaders who support and embody a widespread culture of innovation; change is seen as originating from above but generated throughout the institution (Buller, 2014). According to Alavi and Gill (2017), AL can influence followers' change-oriented attitudes, beliefs, and behaviours by fostering hope, resilience, trust, self-efficacy, and optimism.

When faced with the uncertainty that often accompanies change, followers will seek comfort from leadership. If an effective outcome is desired, AL becomes increasingly important to the vision for change by minimizing cynicism about change and increasing the readiness and commitment for change. In a team-based environment it will be vital that all four components of AL—self-awareness, moral perspective, balance processing, and relational transparency—be explicitly enacted to achieve the desired outcome.

Self-awareness. AL supports the idea that personal awareness and a clear sense of self allows for values-based decisions that are aligned with a person's most authentic self (Gardner et al., 2005). In my setting, there are explicit activities, individually as well as departmentally, that can serve to improve my self-awareness. Completing the Meyers-Briggs test (McCaulley, 1990) as well as StrengthsFinder 2.0 (Rath, 2017) will enhance self-awareness of my leadership style and strengths. Debriefing with my peers will demonstrate willingness to be vulnerable and reveal a higher level of authenticity.

Moral perspective. Resisting external pressures that threaten personal morals when making tough decisions is the hallmark of an authentic leader (Luthans & Avolio, 2003).

Together with increasing self-awareness I will need to first articulate my values, and then adhere to them when confronted. This will become more difficult when my personal morals are threatened, but I will endeavour to seek understanding from peers to effectively communicate how a decision is made.

Balance processing. Analyzing information objectively and considering the opinion of others supports AL by allowing for impartial decisions (Luthans & Avolio, 2003). I will solicit opinions from others as well as seek out as much objective information as possible to engage my peers and help them be part of decisions. In a team-based environment it is critical to draw people in and not alienate them.

Relational transparency. Sharing my core feelings, motives, and inclinations will demonstrate relational transparency (Kernis, 2003). Tied to the other components of AL, relational transparency can be achieved through debriefing the results of my Myers-Briggs Test as well as my StrengthsFinder 2.0 assessment. This will improve rapport with my peers and allow for deeper mutual understanding. Revealing and adhering to my values explicitly when confronted with tough decisions will build trust and demonstrate consistency. Seeking out information and the opinions of others serves to engage and draw team members into the decision-making process. Taken together these components of AL will be necessary when confronted with the upheaval and change required to advance towards sustainable technology institutionalization.

As leadership approaches set the tone for the environment in which the actors operate, AL supported by DL is most appropriate to the desired outcome in a sustainable fashion. The very nature of a task culture requires a great deal of trust among fellow team members. To foster the exchange of ideas and to cultivate an innovative environment, the single best way to lead is

through a style that holds trust as a central tenet. Past success in leveraging my personal strengths provides confidence for future enactment. Furthermore, both AL and DL align with my personal knowledge, morals, logic, and beliefs. From a practical perspective, AL has been shown to have a strong influence on faculty creativity and intrinsic motivation in HE (Ahmad, Zafar, & Shahzad, 2015). Additionally, DL fits well with moving towards a task culture because it focuses less on individual characteristics and situational features, and more on social processes of teams distributed across an institution (Bolden, 2011).

The next section outlines the framework for leading the change process and briefly discusses the type of organizational change and context. A conceptual model is also presented.

Framework for Leading the Change Process

Organizational change can be characterized by two dimensions: organizational response and continuity (Cawsey et al., 2020). Organizational responses can be further described as anticipatory or reactive, and types of change can be incremental or radical. Moreover, when the organizational response and continuity are considered in combination, four unique types of change emerge: tuning, reorienting, adapting, and overhauling—each with their own characteristics (Cawsey et al., 2020).

Considering the typographies for change informs a pathway forward that is aligned with my organizational context. Critical reflection on my own PoP—sustainable MR institutionalization—leads me to think that adaptive, or reactive and incremental, change is required to advance digital transformation at College X. The key characteristics of an adaptive organizational change are incremental changes in response to environmental change, the need for internal alignment, the focus on individual components, the role of middle management, and the major task being implementation (Cawsey et al., 2020). Adaptive change aligns with

functionalism in that it views the individual components working together towards equilibrium. Furthermore, NIT supports the notion that adaptation to external environment is required to maintain legitimacy.

In considering these characteristics of organizational change, it becomes clear that adaptive change will be a crucial part of the plan. College X is reactive in nature and highly responsive to stakeholders and the community in which it operates. Additionally, organizational change originating in the administrative realm is bureaucratic. To this extent, change at College X is currently planned and incremental.

Given the high-level strategic plan's prioritization of innovation (College X, 2016), as well as the existence of faculty digital literacy skill development (College X, 2018a) and Creativity and Innovation Projects (College X, 2018b), there are scattered initiatives begging for internal alignment and coordination at College X. To facilitate incremental changes and alignment, the focus needs to be on subsystems as opposed to the entire institution. Although the goal is to work towards overall institutional change, efforts need to start with smaller-scale projects that can provide the proving ground required before larger-scale digital transformation can occur. This approach is supported by the functionalist view of parts working as a whole. The benefit of the smaller-scale projects is more implicit than explicit, considering the political realm; allies and enemies will reveal themselves, resources will be procured, relationships forged, informal relationships created, and success will generate new opportunities as excitement and knowledge mobilization increases.

As mentioned earlier in Chapter 1, neither top-down initiatives from administration nor bottom-up endeavours from faculty are ever wholeheartedly embraced institution-wide. There is a heightened requirement in a role culture for middle management, or in my case a program

leader, to provide a dual purpose and to be able to function in both realms: faculty, within the collegium, and administration, within the bureaucracy. Tied into the trajectory of digital transformation discussed in Chapter 1—from adoption to implementation through to institutionalization—the challenge of sustainable institutionalization and digital transformation can be broken down into a nuanced understanding.

Some faculty adopt MR easily, others do not. Rogers (2010) characterized early adopters as thought leaders who are younger, more prosperous, well connected, and more progressive. I have identified early adopters among faculty, and they have confirmed their interest in MR technology through informal conversations. Early adopters represent green shoots of adoption, or a push for MR institutionalization, as shown by their interest and propensity for MR technology uptake. Effort would be best directed towards working with current innovators. At the other end of the spectrum, administration has communicated a desire for innovation and institutionalization, yet does not have the ability to fully convince faculty to follow, or a pull for MR adoption. Taken together, integration and implementation are the major task, aligning with adaptive organizational change. Reviewing DIT and considering the parallel nature of institutionalization discussed by Curry (1992), it becomes apparent that integration and thus implementation is the major task that needs to be addressed through the OIP.

Context

As discussed in Chapter 1, the interrogation of the PoP is framed by functionalism and NIT. Considering this approach, the framework for change needs to also be aligned with the principles described by functionalism—parts working with each other to achieve equilibrium, defined roles, constrained choices, change seen as inevitable and natural, and consensus and shared values (Garner, 2019; Stepnisky, 2019)—along with those of NIT—organizations

constrain individualism, informal structures influence formal structures, and legitimacy is sought through adherence to rules (DiMaggio & Powell, 2000; Meyer & Rowan, 1977; Powell & DiMaggio, 2012; Rowan & Miskel, 1999).

The next section proposes a novel conceptual model to guide the framework for change; it ties together elements of the technology adoption model CBAM and the change path model (CPM; Cawsey et al., 2020)—in order to lead the changes required to meet the identified goals of the PoP.

Conceptual Model

To frame a discussion about how to bring about change, this section introduces a conceptual model that draws upon several existing theories and models that have overlapping components and shared dynamics. Unique inputs, context, and outputs will mediate how College X can work towards MR institutionalization.

Concerns-based adoption model. CBAM was developed at the University of Texas to address concerns educators had with adopting and integrating technology into their classroom. It views change as a process where individuals are the focus (Hord, Stiegelbauer, Hall, & George, 2006). Faculty adoption of technology is the first step towards acceptance within HEIs. Technology adoption is a personal decision on the part of faculty. Sometimes an innovation might make it to the second stage: integration into andragogy. The diffusion of technology, on the other hand, describes the social phenomenon: integration to institutionalization.

Several models have examined the overall trajectory of technology adoption and diffusion. Seminal work by Rogers (1995) and Geoghegan (1994) has been adapted by Hall and Elliott (2003) to describe the characteristic groupings of users: innovators, early adopters, early majority, late majority, and laggards. Although elements of this model hold true, the HEI setting

is bound by unique rules, behaviours, and norms that differentiate it from the open market of consumerism (Hall & Elliott, 2003). I will focus on CBAM to frame the process of faculty decisions to adopt and then integrate MR because it aligns with relational aspects of functionalism and further refines available choices through NIT. As illustrated in Figure 4, CBAM reveals the interplay of behaviours, choice, and setting as context.

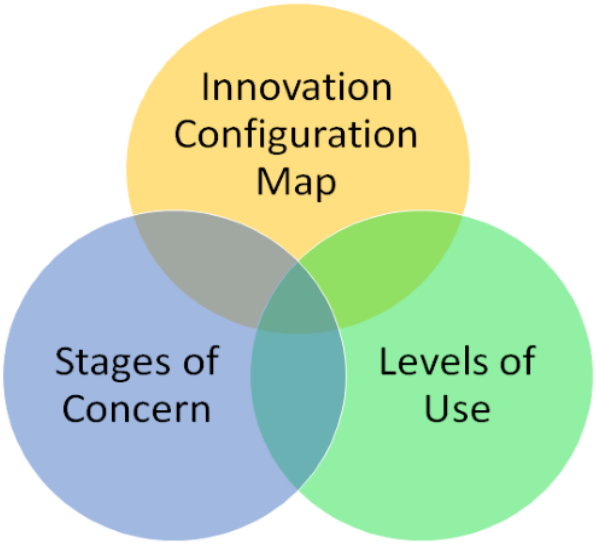

Figure 4. Concerns-based adoption model domains.

Figure 4 shows the confluence of the three dimensions in CBAM: stages of concern, levels of use, and an innovation configuration map. Stages of concern assesses the affective domain, levels of use examines how or even if technology is used, and an innovation configuration map describes the ideal state for how an innovation should be used. CBAM is significant because it considers how personal experience influences the outcome, recognizes that emotion and skills are dynamic, and reflects that a diagnostic or prescriptive approach can be used effectively (Hall & Hord, 2015). CBAM is thus a diagnostic tool that can inform a positive, prescriptive path from adoption towards integration. Considering faculty decisions to adopt and integrate MR into their andragogy, as a leader I need to understand the factors that allow or prevent digital transformation within the locus of individual faculty control. This understanding

can be leveraged to carefully craft communication around how to best demonstrate that MR institutionalization is of value to them. CBAM explains *why* faculty choose to adopt and integrate technology.

What remains then is to understand how this part, faculty decisions to adopt or reject technology, progresses as part of the whole organization. The next section uses the CPM to show how similar patterns of parts working as a whole towards equilibrium—functionalism—exist along the MR institutionalization trajectory.

Change path model. The CPM (Cawsey et al., 2020) is an organizational change model derived from the prior work of Kotter (1996) and Lewin (1951). It combines process and prescription into a linear model for change divided into four stages: awakening, mobilization, acceleration, and institutionalization. Awakening describes how leaders need to be aware of environmental clues that hinder or abet change; this stage describes the *need* for change. Mobilization is characterized by determining *what* needs to change, engaging stakeholders, communicating the need for change widely, and leveraging assets for change. Acceleration is a consolidation process where transitions and progress advance through dynamic and further refinement of the strategy. In the final stage of the CPM, institutionalization, change becomes permanent as new supporting systems are established and a new organizational reality is created (Cawsey et al., 2020). Whereas CBAM is intended to be used at the individual level by faculty, and NIT limits choices made available to administrators in the bureaucratic realm, CPM explains how change happens at the organizational level, including both faculty and administration. CPM provides an overarching path to consider how MR technology transitions from adoption to institutionalization, by considering how contextual elements can be encouraged and enhanced.

The next section presents my conceptual model, which combines CBAM, NIT, and CPM, to propose the digital transformation of College X.

Conceptual framework. My conceptual framework came about due to the gap in current theory and the need of College X to go through an adaptive change process. Understanding how technology is initially adopted by faculty, integrated into andragogy, and finally institutionalized has led me to propose a working conceptual framework, named the towards sustainable technology institutionalization (TSTI) model and graphically represented in Figure 5 (Mekelburg, 2020). TSTI takes into consideration actors, change theory, leadership, organizational theory, governance, and roles. The two models described above, CBAM and CPM, are adapted and embedded within TSTI.

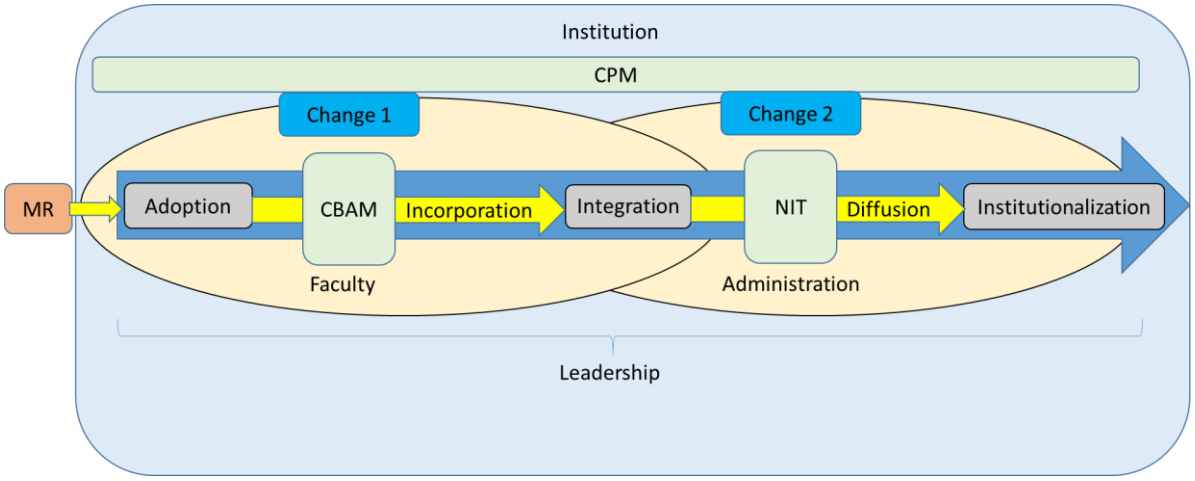

Figure 5. TSTI conceptual model. From *Towards Sustainable Technology Institutionalization (TSTI) Conceptual Model*, by B. Mekelburg, 2020, Unpublished manuscript, Faculty of Education, Western University. CBAM = concerns-based adoption model; MR = mixed reality; NIT = neoinstitutionalism.

Figure 5 illustrates that TSTI integrates elements of CBAM and CPM and has three stages: adoption, integration, and institutionalization. MR is an external reality to the overall institution and needs to be brought into the environment by a faculty member, a step also known as adoption. Change 1, from adoption to integration, is mediated by CBAM and is called

incorporation. CBAM mediates the decision to integrate MR into andragogy. This trajectory is only one direction and initiated by faculty. Change 1 is the responsibility of individual faculty.

Change 2, from integration to institutionalization, is regulated by NIT and is called diffusion. Change 2 is in the realm of administration. Decisions made by administration are moderated by NIT and directly influence whether integrated MR technology can be supported with the resources required to transition through to institutionalization.

Both changes require pan-domain leadership using CPM to leverage roles and tasks integral to advancing sustainable MR institutionalization.

Adoption. Faculty, who are defined by their role, are responsible for deciding to adopt MR and then integrate technology (Change 1); their decision-making is mediated by CBAM. Faculty will make this decision primarily based on choices that are constrained by their role. Contemporaries in the external professional field will determine the legitimacy of their choice. Individual faculty members can exert expertise and legitimate power determined by their role—functionalism. Faculty power, in this context, is limited and excludes them from broader decision-making arenas that would promote the institutionalization of MR. The OIP aims to integrate processes through AL and DL to cultivate further enfranchisement.

Institutionalization. Administration is responsible for deciding to support integration efforts with resources to institutionalize technology (Change 2); this decision-making is mediated by NIT. Administrators who make broad strategic decisions for the institution may seek an innovation agenda to set the institution apart from contemporary competition for tuition derived from students. NIT shows that isomorphism ensues and institutions quickly all look and act the same (DiMaggio & Powell, 2000; Powell & DiMaggio, 2012). Despite best intentions, the desire for an innovation agenda is constrained by an administrator's role, and they are not

able to force faculty to adopt MR technology and integrate it into their andragogy. Administrators are excluded from adoption decisions. Academic freedom is highly protected at College X and excludes administration from adoption decisions.

Integration. The overlapping area of the yellow ovals in Figure 5 shows contested space and is labelled *Integration*. Integration is the primary barrier to institutionalization. My assertion is primarily supported through experiential knowledge and is further clarified by Rambe and Dzansi (2016), who identified that integration is indeed the contested space requiring careful consideration in HE. Rambe and Dzansi asserted that locus of control, power contestations, alignment of technology with andragogy, and shared intentionality are central to integration of technology in HE. Furthermore, they concluded that a DL approach best negotiates the contested territory of integration.

Within my context, and informing my proposed TSTI model, from a faculty perspective, efforts will never grow past personal use of MR without administrator support. Administrators, on the other hand, will never have strategic initiatives like innovation realized without a faculty partnership. Conclusively, my assertion is that the integration of MR is the fundamental change that needs to be addressed.

The TSTI model proposes that leadership, guided by the CPM, is the pan-institutional element that would allow for sustainability, coordinated efforts, effective use of technology, and efficient deployment of resources. This conceptual model is aligned with AL and DL; what remains is to turn attention specifically to *what* needs to change. The next section provides a critical organizational analysis and reveals gaps to be addressed.

Critical Organizational Analysis

Chapter 1 discussed my perspective on the change readiness of College X and applied the readiness for change tool (Cawsey et al., 2020) to describe the composite landscape of College X. Although Qian (2019) made the case that digital transformation *is* academic transformation, the overlying functionalist view taken at College X perceives them as separate and distinct. It is thus my intent to assess the receptiveness and resistance to MR institutionalization, as well as to determine where the gaps exist to propose workable solutions. This section identifies the gaps and articulate *what* needs to change for the desired state to be achieved. Additionally, I apply the CPM described in Cawsey et al. (2020) along with my conceptual model (TSTI) to describe—diagnose and analyze—the situation and changes required.

In the previous section the type of organizational change required was revealed to be *adapting*, where the primary need is for alignment. What follows is a description of the internal and external gaps as well as a description of *what* needs to change.

Internal Gaps

The change readiness analysis in Chapter 1 revealed that several internal gaps exist and need to be addressed: a lack of desire for change, nonexistent action, constrained resources, competition for resources and strategies, and nascent technology.

Lack of desire for change. My initial thoughts are that the desire for change is lacking because of institutional inertia. In consideration of functionalism, this makes sense—equilibrium is a desired organizational state (Garner, 2019; Stepnisky, 2019), and any proposed change threatens that desired state. Furthermore, although functionalism views change as inevitable and natural, it also explains that choice is constrained by roles (Garner, 2019; Stepnisky, 2019). In my context then, the lack of desire for change could be interpreted as the lack of a capacity to

choose within a defined role. Faculty who strive for regularization, and hence job security, will not take risks if they are currently getting favourable performance reviews; their gaze and actions are directed towards personal survival as opposed to the digital literacy skills students seek and employers will demand in the future. Considering the CPM, broader understanding of MR as an educational technology demands that a powerful vision for change needs to be developed as part of CPM Stage 1 (Cawsey et al., 2020) —that is, the awakening.

Nonexistent action. Tied together with the lack of desire for change is nonexistent action. This is an interrelated and linear relationship with the desire for change preceding action. It only makes sense that low desire levels lead to little if any action to move any initiative forward. Furthermore, functionalism indicates that if there is no formal structure, system, or role in place to advance the initiative, action is not even possible (Garner, 2019; Stepnisky, 2019). The absence of a system, structure, or process needs to be addressed. My thought is that an informal structure needs to inform a formal structure in order to work towards this endeavour; NIT supports this notion (DiMaggio & Powell, 2000; Powell & DiMaggio, 2012) and relational capacity should be leveraged to create the structure required. According to the CPM, the creation of a structure, system, or role in support of the initiative is part of the mobilization stage. In order to stimulate action, proper structure needs to be in place that would allow for it to emerge.

Constrained resources. Any new initiative requires support through access to proper resources. Within my context, hardware and software has been procured through informal channels. What remains is the primary need for enhancement of the temporal resource required to bridge the gap between top-down strategies and grassroots efforts. Within the current role culture, there is no formal position responsible for the advancement of MR. This is where influence needs to be enacted. Although possibilities exist within current systems to dedicate

time to the integration of MR from both faculty and administration, it remains informal, misaligned, and disorganized. The gap identified is that temporal resources, are not optimally enacted. Moreover, formal structures are not aligned. Solutions targeting this gap are analyzed in Chapter 3.

Alignment of time commitments represents the leveraging of assets, which is part of the mobilization stage of the CPM (Cawsey et al., 2020). Underlying support through functionalism (Garner, 2019; Stepnisky, 2019) as well as NIT (DiMaggio & Powell, 2000; Powell & DiMaggio, 2012) indicates that equilibrium, order, and stability can be achieved through careful consideration for the creation of formal structures and systems that provide temporal resources that serve to optimally support the advancement of MR institutionalization.

Competing strategies. Despite best intentions, top-down strategic endeavours do not necessarily align with grassroots efforts to integrate MR into College X. To this extent, administration *pulls* MR integration through strategic planning, creativity and innovation competitions, and financial resource allocation. Faculty, on the other hand, *push* MR integration through personal adoption, aligning MR with andragogy as well as sharing and distributing knowledge with their contemporary peers through publishing, blogs, and less formal channels of communication. The gap here is that the competing strategies are role based and serve to preserve selfish equilibrium and survival. Functionalism explains that a defined role needs to be created that will allow for alignment of faculty-led efforts with administrative-led strategy (Garner, 2019; Stepnisky, 2019). Shared values exist and are present, but what remains is a need to put them to work better through what the CPM (Cawsey et al., 2020) describes as part of the mobilization stage.

Nascent technology. MR is incredibly young. The hardware used is less than 5 years old and not widespread. Although the price has come down significantly recently, it still limits uptake of the market as a whole; accessing the technology is still relatively expensive and undermines widespread adoption. My observation is that instead of a focus on price reduction, industry participants are more concerned with increasing the quality of their offerings while maintaining a price point. An example of this is the Oculus Rift. First-generation headsets became more affordable after the first few years, dropping from $1,200 CDN down to $399 CDN. Instead of continuing to make their first models more affordable, the manufacturer stopped making the first edition in favour of a wireless model that increased user comfort marginally; it simultaneously increased the barrier to entry for users by increasing the price to $599 CDN.

Due to the nascent nature of MR technology, competition is limited, resulting in little incentive for hardware manufacturers to make their technology affordable. Functionalism explains that change is inevitable and a natural progression (Garner, 2019; Stepnisky, 2019), due to the nascent nature of MR technology there is neither widespread nor large-scale uptake. My thought is that large-scale uptake of MR is no different than any other technology; Rogers's (2010) DIT suggests we are simply in the incredibly preliminary stages of MR adoption. Clearly then, the gap that exists, according to the CPM (Cawsey et al., 2020), is an awakening stage effort that serves to develop a powerful vision for change to overcome potential financial barriers. The goal should be to facilitate widespread access to MR technology.

External Gaps

The change readiness analysis in Chapter 1 revealed that several external gaps exist and need to be addressed: lack of community awareness, lack of demand for MR technology, sectorial striation, and a lack of best practice guidelines.

External awareness. Chapter 1 discussed the close, responsive relationship that College X has with the local community. The institution is engaged with the local community through many events, outreach, partnerships, and communications. The college actively seeks out promotional stories from within to share more broadly. Inevitably, not all the college's successes get promoted or communicated widely via the social media channels used for broadcasting messages to the public. Even though there has been some limited activity and concomitant success adopting MR into andragogy, the message has not been widely publicized. It appears that MR technology is still on the fringe of acceptance as an educational tool and is not considered significant enough to warrant wider promotion in the community as an example of innovation.

Functionalism shows that even though MR adoption and success by faculty is inherently positive and has intrinsic benefits, the *choice* to promote it outside the institution is constrained (Garner, 2019; Stepnisky, 2019). Furthermore, NIT explains that legitimacy is gained by following rules and external interactions, and behaviours are attributed to the environment (DiMaggio & Powell, 2000; Powell & DiMaggio, 2012). Innovation is inherently threatening to the status quo and equilibrium, and if College X is already held in high regard in the community, promoting an activity that might disrupt that relationship might be perceived as risky. The gap identified is that a well-crafted communication that softens the risk presented by innovation could pave the way for outward-facing promotion of MR institutionalization, thereby raising external awareness. This would be best addressed within the first stage of the CPM (Cawsey et al., 2020), awakening, by disseminating the vision through multiple communication channels. External awareness can be heightened by crafting a communication strategy that aligns MR institutionalization with College X's (2016) strategic plan.

Lack of demand. Connected to the previously discussed gap of external awareness, there is a lack of demand for the use of MR technology as an educational tool from students. As noted in Chapter 1, College X does not collect any data on MR technology use. This is problematic because it leaves only anecdotal and experiential reflection, and researchers cannot empirically assess MR adoption or integration efforts. From my perspective, students do not demand or expect MR use in my lectures. In fact, they are often pleasantly surprised, and this becomes their maiden voyage into the world of MR; they were not even aware that MR could be used as an educational tool. The gap here is a lack of demand for the use of MR as an educational tool, primarily due to the lack of awareness discussed previously. NIT suggests that organizations constrain individualism (DiMaggio & Powell, 2000; Powell & DiMaggio, 2012). In this sense, innovative use of MR as an educational tool is *not* widely accepted—it is a nascent technology—and adopting MR as part of andragogy can be viewed as highly individualistic. Furthermore, students are accustomed to lecturers who adhere to organizationally accepted norms for delivering content in class. The situation that arises then is one where faculty eschew technology, students grow accustomed to the usual approach, and thus are not even aware of the possibility to demand—or ask—for innovation to be part of their educational experience.

Considering the CPM (Cawsey et al., 2020), what needs to change is the normalization of MR as an educational tool. This can be best addressed through Stage 3 and acceleration efforts to engage other faculty members to empower them in the development of new skills, knowledge, and abilities. My thought here is that the fetishizing of nascent technology can be diminished as the comfort with the use of the technology increases. Rogers's (2010) work on the diffusion of innovative technologies (DIT) demonstrates that there will always be early adopters who will be most appropriate to lean on for support while moving towards the goal of institutionalization.

DIT also explains that there will be laggards who resist efforts; it will become important to also identify where these pockets of resistance exist. The next section discusses sector striation and how inherently some departments or employment sectors are typically more receptive to MR than others.

Sector striation. Chapter 1 mentioned that some sectors are more receptive than others when it comes to the integration of MR technology into education. Moreover, some employment sectors value and seek digital literacy skills. College X aligns the organizational hierarchy with employment sectors. Healthcare programming, as an example, is grouped together, as are the trades, computer sciences, university transfer, as well as business schools. This makes it easy to assess sector support, or lack thereof, for MR technology. Sectors that are inherently reliant on digital technologies, like medical imaging, are extremely receptive. Furthermore, industries such as road construction and mining, where MR technology is already proving beneficial and employers are starting to ask for graduates to have digital literacy skills, are also supportive and the corresponding schools are receptive. University transfer programming, on the other hand, with its focus on humanities courses where Socratic pedagogies prevail, is resistant to MR technology.

Sectorial striation is not surprising given the functionalist perspective; equilibrium (Garner, 2019; Stepnisky, 2019) has been long achieved in the way a first-year English course is taught. Moreover, NIT shows that legitimacy is gained by following rules and that external contemporaries within a field of study exert significant influence through informal structures (DiMaggio & Powell, 2000; Powell & DiMaggio, 2012). English class lecturers are constrained in their ability to adopt MR technology as part of their andragogy simply because their contemporaries do not accept it as a legitimate tool.

Sectorial striation is further enhanced by fields of study that rely heavily upon digital technologies as part of their regular skills and expected abilities, such as medical imaging. Functionalism explains that change is inevitable and a natural progression (Garner, 2019; Stepnisky, 2019); in medical imaging I have personally witnessed the evolution of film-based imaging to digital imaging, and now towards MR technology as the new frontier for visualizing the human body. NIT further reinforces the idea of this sectorial striation by supporting the idea that people's behaviours are attributable to their environment (DiMaggio & Powell, 2000; Powell & DiMaggio, 2012). The environment of medical imaging is predicated on technological innovation; it is no wonder that behaviours and educational approaches for future professionals fully support the adoption of MR technology as an educational tool.

Given the sectorial striation, the gap that needs to be addressed is the strategic investment of efforts and resources into only those sectors that require it and embrace change. In other words, a heightened level of organizational awareness brought about by an intimate understanding of the departments, schools, and sectors that comprise College X and their needs will help guide this OIP. In considering the CPM (Cawsey et al., 2020) and the second step of mobilization, attention is drawn to the suggestion to build coalitions and support. Given that MR institutionalization is truly an organizational change at the macrolevel, it only makes sense then to invest energy and resources into strategic alliances with supporters in other sectors that can help advance MR digital transformation efforts.

Lack of best practice guidelines. The final gap discussed in this section is the lack of best practice guidelines as applied to incorporating MR into andragogy. Tied together with the fact MR is a nascent technology, my perspective is that despite many well-intentioned faculty, efforts to incorporate MR technology as a learning tool into their andragogy are not grounded on

any best practice guidelines. A cursory search for relevant literature in this area returns zero hits. Setting aside the argument that best practice guidelines are *actually* required in HE, NIT explains that legitimacy is gained through following rules (DiMaggio & Powell, 2000; Powell & DiMaggio, 2012). In this sense, College X seeks legitimacy by supporting faculty through the Centre for Excellence in Teaching and Learning. Organizational legitimacy is gained through faculty development of andragogy, including adherence to best practices.

The external gap that needs to be addressed is the lack of best practice guidelines for aligning MR technology with andragogy. Since awareness of MR within the field of educational technology is high, it is only a matter of time before early research aligning it with andragogy emerges. The lack of research in this area should not prevent adoption; however, it will be important to consider Step 3, acceleration, of the CPM (Cawsey et al., 2020) and to keep abreast of developments in best practice guidelines. Critically analyzing best practices as they emerge and systematically implementing them will serve to advance digital transformation towards MR institutionalization.

In the next section, the focus moves to possible solutions. The critical organizational analysis reveals significant areas to address through this OIP; it is now imperative to address them through possible solutions to the PoP, which is the lack of a sustainable MR institutionalization plan.

Possible Solutions to Address the Problem of Practice

In order to best address the PoP, this OIP advocates implementation of all the following solutions as part of a holistic improvement plan. They are integrated and best executed alongside each other; aligned with a functionalist perspective, these individual parts best work together as a whole in order to support institutional equilibrium.

This chapter earlier revealed that the *type* of change required at College X is *adapting,* which requires reactive and continuous efforts (Cawsey et al., 2020). The larger theme of *aligning* efforts and resources emerged. Moreover, in the previous section, the changes required using the CPM (Cawsey et al., 2020) were discussed; the need for several changes within the steps of awakening, mobilization, and acceleration were identified. In addition, Schrum and Levin (2016) implored readers to consider the importance of engaging stakeholders, collaboratively planning for technological change, and modernizing instructional strategies. In the next section, attention turns to three possible solutions to the PoP, and I draw upon the Kaizen continuous improvement tool to address the identified gaps.

Kaizen is a continuous improvement cycle tool that makes use of the Plan-Do-Check-Act cycle, later adapted to Plan-Do-Study-Act, made popular by total quality management researcher W. Edwards Demming who sought to improve manufacturing procedures in Japan (Murata & Katayama, 2010; Singh & Singh, 2009). The four steps of the cycle are characterized by the activities undertaken: Plan—plan for change and predict the results, Do—execute the plan in a controlled manner, Study—analyze the impact of the action, and finally Act—take action to improve the process (Singh & Singh, 2009). After Demming's seminal post–World War II work, several similar trademarked continuous quality improvement strategies (Sigma6, LEAN, Just-in-time) evolved from this work and were implemented in many sectors (Singh & Singh, 2009).

I first came across Kaizen in 2010 during my work in healthcare and participated in several process improvement projects aimed at reducing wait times for healthcare access. As a linear, sequential thinker, the process was logical, engaging, and team oriented—precisely the benefits described by Demming—which fits well with my leadership as well as context at College X (Singh & Singh, 2009). The Kaizen tool was selected as a continuous quality

improvement tool to guide the solutions and focus because it aligns with the theoretical framework of functionalism and NIT. Specifically, the principles with appeal are as follows: Parts work together towards equilibrium, choices are constrained, roles are defined, informal structures can inform formal structures, and behaviours are attributed to the environment in which people operate (DiMaggio & Powell, 2000; Garner, 2019; Powell & DiMaggio, 2012 Stepnisky, 2019).

Chapter 1 identified four overarching goals to be addressed as part of the OIP: Collect internal data about MR institutionalization, establish digital equity, build expertise capacity, and enhance hierarchical communication. Furthermore, the critical organizational analysis revealed several gaps that need to be addressed. Internally, there is a lack of desire for change, action is nonexistent, resources are constrained, there are competing strategies, and the technology is nascent. Externally, there is a lack of awareness in the community, a limited demand for MR technology, sectorial striation, and a lack of best practice guidelines. Each goal for a desired state can be best addressed through the underlying gaps. They are organized in such a way that the smaller gaps are categorized under an overarching goal.

1. Collect internal data about MR institutionalization
    i. Constrained resources
2. Establish digital equity
    i. Sectorial striation
3. Build expertise capacity
    i. Lack of action
    ii. Nascent technology
    iii. Limited demand

iv. Lack of best practice guidelines

4. Enhance hierarchical communication
    i. Lack of desire
    ii. Competing strategies
    iii. Lack of community awareness

Furthermore, addressing these goals will target the contested territory mentioned in Chapter 1, which is vital to bridging top-down visions with bottom-up initiatives. If the goals are addressed and executed, they will mediate the integration step of the proposed TSTI, which is the stumbling block identified. Applying the Kaizen tool reveals strategic opportunities to move towards sustainable technology institutionalization.

Solutions

As part of the Plan-Do-Study-Act continuous improvement cycle, the solutions described here are the result of an evidence-informed planning phase. This section briefly mentions the predicted outcome for each solution. Due to the limited nature of the plan, the study, or act, steps of the cycle are unable to be completed. A Kaizen PICK (possible, implement, challenge, and kibosh) chart helps to organize the solutions under consideration (see Figure 6).

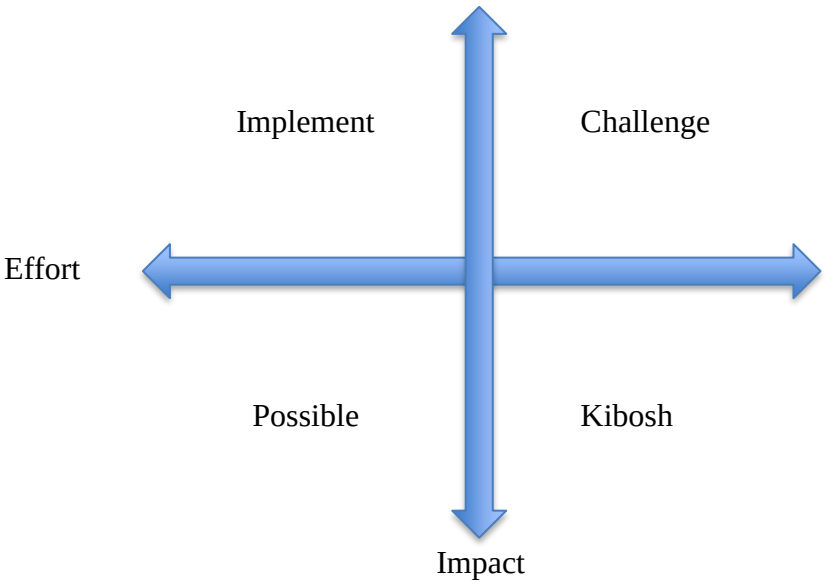

Figure 6. PICK chart.

Gathered evidence was used to categorize the goals using the Kaizen PICK chart for prioritizing solutions. The PICK chart is based upon two metrics: impact and effort. Graphically it creates four quadrants based on the joint characteristics: possible—low impact and effort, implement—high impact and low effort, challenge—high impact and effort, and kibosh—low impact and high effort. The aspect appreciated most about using this chart to prioritize initiatives is that it makes ideas visible.

Given the structure to consider solutions provided by the PICK chart, attention now turns to the solutions to consider their likeliness of succeeding. The next section introduces, interrogates, and applies the PICK chart to the disaggregated solutions.

Solution 1: Collect internal data about MR institutionalization. Cost: $2,000. Time: 1 week. College X needs to start collecting internal data about MR institutionalization. Chapter 1 revealed that College X makes decisions based on evidence-based practice to improve the efficiency and effectiveness of policy decisions. One of the primary requirements for evidence-based practice is good data (Head, 2010).

Chapter 1 also revealed that there is a complete dearth of internal data on this topic. The administration realm—where decisions about resources are made—operates in a bureaucratic mode. Data is used to inform decisions, and empirical evidence objectively supports or refutes the need to expend resources. Because College X operates within a role culture—and there is no role for MR institutionalization—data is absolutely required to inform decisions. The decision to align temporal resources with digital transformation responsibility demands that data exists. To this end, internal data needs to be collected through institutional research to help inform senior leadership about MR institutionalization decisions.

The data sought will inevitably evolve; based on the work of Kontić and Vidicki (2018), the most important information required will concern the current hard assets on hand—inventory, the number of faculty who currently actively use MR, and the number of faculty interested in working with the technology. Furthermore, student demand will need to be assessed to show that there is a desire for more MR-integrated andragogy.

Currently, the directive to collect data through the Institutional Research department needs to come from administration. However, there are also more informal methods to collect relevant data. Two practical solutions exist then: formal data collection performed by the Institutional Research department or informal data collection done by me. This priority is categorized as a *possible* strategy to implement from the Kaizen PICK chart because it is a low-effort and low-impact endeavour.

Formal data collection. Based on my experience working at College X, my proposal to senior administration to initiate internal data collection about MR institutionalization through the Institutional Research department should be met with acceptance. Administration is already committed to moving forward with innovation, and they are entrenched in empirical evidenced-

based behaviour. Communication of the desire for information and need for the data should be straightforward. The budget for institutional research is covered already and adding a small study of about 10 questions using existing surveying software should have minimal impact on the budget. Other than the explicit benefit of collecting data on MR institutionalization, the implicit benefit of initiating internal data collection is that it becomes a flashpoint for further discussions about MR institutionalization, essentially raising the profile and awareness of the initiative at the levels of administration, faculty, and students.

Informal data collection. Should formal avenues be limited, internal data collection can still proceed making use of informal channels. The same information can be collected using survey software that currently exists within the institution's learning management software in combination with internal email accounts. Because this process is easily scalable to reach all faculty and students, there is minimal cost associated with it. The time component required would be about four hours to set up the questions, and then about 10 hours to monitor and collate the data; I could take on this role myself. The benefit of using an informal channel is that precise questions can be asked without an added layer of administration filtering out questions that are not important to them. The drawback of course would be the requirement for additional time to complete the work as well as not having access to the research expertise of the Institutional Research department.

Regardless of the solution selected, the ultimate outcome would be that the collected empirical data would best position administrators to make informed decisions with the hope of removing the shackles of constrained resources. Data should bring experiential knowledge into the role culture realm, expressed in a way that demonstrates a heightened need for increasing temporal resources dedicated to the advancement of MR institutionalization.

Solution 2: Establish digital equity. Cost: $40,000. Time: 6 months. Chapter 1 discussed the priority for change of establishing digital equity. According to Forsyth (2006), students do not currently have equitable access to the required hardware. The goal is to submit a proposal asking for MR-enabled iPads for students to use. Each student should have access to the hardware required to participate and acquire the digital literacy skills needed to work within the medical imaging sector. The need for the hardware is rationalized by making the case for digital literacy skills (Goff & Ahmad, 2015; Otieno, 2015; Staples et al., 2018) as well as demonstrating the need to study anatomy in 3D; this is authentically how knowledge is applied in the clinical setting of medical imaging (Berney, Bétrancourt, Molinari, & Hoyek, 2015).

I have categorized this priority as an *implement* strategy from the Kaizen PICK chart because it is low effort and high impact. Proposal writing for hardware acquisition at College X is a straightforward process with which I am familiar; it would take about 2 days to complete the task and would only require the use of a computer.

This solution addresses the sectorial striation gap at College X. Currently, none of the departments enjoy digital equity of MR technology. Furthermore, as mentioned earlier, some sectors and industries are more heavily reliant on technology than others. Sectors that are reliant on technological developments should enjoy access to the tools required to train for their professions. Sectors and programs that do not need access to MR technology are not being left behind, as some might critique. Digital equity from a sectorial striation perspective means that those programs that can rationalize a need for MR technology should be able to provide the hardware to all their students—which is *not* to the detriment of students in programs that do not require technological advancements.

If successful, the cost of 30 iPads loaded with the proper software required for MR content would require an initial outlay of $40,000. Although this is not inconsequential, it is also entirely possible and within reach for College X. The benefit of having digital equity on a small scale will be that MR integration will be demonstrable to other faculty as well as administration. The hope is that it will inspire other faculty to also start building capacity and adopting MR technology.

Solution 3: Build expertise capacity. Cost $4,000. Time: 2 weeks full-time equivalent. Chapter 1 discussed the priority of building expertise capacity. Timperley (2011) advocated for developing adaptive expertise in education and organizations. Bransford (2007) promoted adaptive expertise, where faculty strive to improve their approaches to promote the learning of their students more effectively.

Currently there is limited adaptive expertise and capacity in the mastery of MR digital literacy skills at College X. Early adopters are still learning MR digital literacy skills daily and exploring ways to integrate MR technology into their andragogy. In terms of the bigger picture of moving towards sustainable technology institutionalization, MR digital literacy skills are at the heart of sharing expertise and knowledge with students—and even other faculty. A very compelling case is made by asking, if faculty lack MR digital literacy skills, how can they possibly share that knowledge, skill, and expertise with their students?

Earlier in Chapter 2, the gaps related to building expertise capacity were identified as nascent technology, lack of best practice guidelines, limited demand, and limited action. The recommended solution targets these four gaps. Although there is nothing that can be done about the inherent nature of nascent MR technology, fears, and apprehensions that inexperienced users might have can be minimized by sharing knowledge through seminars and by inviting peers into

my lectures. The benefit of course is that by demonstrating vulnerability and taking a risk with a nascent technology, other faculty should also begin to feel more at ease. Showcasing technology will increase the demand for the use of technology in other departments. Additionally, more faculty will adopt and seek ways of integrating MR technology into their andragogy. Although showcasing the technology has the potential to reach a wider audience of faculty in other departments, the drawback is that constant individual support will not be able to be provided. Additionally, as new faculty adopt and integrate MR technology, unless the supply of new hardware grows along with their interest, the limited supply will be a hindrance to their use. In the absence of best practice guidelines and support, some faculty might get discouraged or lost.

The solution is to host a monthly sandbox meeting for MR users, whereby andragogy-linked questions are posed and then discussed. A sandbox is a safe place to introduce and demonstrate innovative technology. It also allows inexperienced users to experience and experiment with innovative technology. Time is a valuable resource that few can spare, so these sessions will be hosted over lunch hour for maximum exposure and attendance. Rooms are readily accessible, equipment is available for demonstrations, and communications are readily dispersed through internal listservs and promoted by the Centre for Excellence in Teaching and Learning. For those that cannot attend, and to archive and document the proceedings, the sessions will be livestreamed and posted to a private YouTube channel. Topics for discussion will be solicited and once significant expertise is generated, it is expected that the internal data collected from the first solution will reveal as much.

I have categorized this priority as a *challenge* strategy to implement from the Kaizen PICK chart because it is a high-effort and high-impact endeavour. It is evident that if a broad base of faculty possesses MR digital literacy skills, the impact will be institution-wide. The issue

becomes difficult, however, because helping faculty acquire new skills will indeed require significant effort.

Solution 4: Enhance hierarchical communication. Cost: $6,000. Time: 20 hours. Chapter 1 discussed the priority of enhancing hierarchical communication—informal and formal communication that transcends bureaucratic hierarchy and raises awareness, cultivates interpersonal relationships, and builds trust (Kezar & Eckel, 2002; Tierney, 1988). Keeping this in mind, the primary approach is to leverage my current role, which bridges the realms of academia and administration, to increase dialogue and understanding about the needs of each domain. In addressing the current gap, the endeavour is to increase the frequency of communication with senior leadership, report positive experiences and successes, and listen for feedback about how technology leadership can be enhanced to align institutional priorities with MR efforts. This strategy aligns with Kezar and Eckel (2002) and proves a promising approach to advancing the sustainability of MR institutionalization.

Although the channel that allows for this type of communication exists through personal relationships, it is not sustainable. A change in college leadership would have the potential to disrupt existing access to senior leadership. This brings about the need for a more sustainable solution to address the underlying gaps—namely, the lack of desire, competing strategies, and community awareness. It will be important to insulate any efforts towards MR institutionalization so that a change in leadership will not disrupt any advancement. Perlmutter (2020) pointed to change efforts surviving leadership changes in HE as the ultimate confirmation of sustainability.

As described in Chapter 1, the administration of College X operates in a bureaucratic model, whereas faculty operate in a collegium model. The middle ground, or contested territory,

in which they confront each other is moderated by the political model. Overlying all their behaviour is a role culture. A shift to a task culture needs to take place. Although current experience dictates that there is hesitancy on both parties' part to engage in such a model, because they stand to lose credibility that is assured through a role culture, the identified solution promises so much more for students and the advancement of MR institutionalization. The challenge requires leveraging current personal relationships to enact a temporary shift towards a task culture. Without such a shift, MR institutionalization is sure to fail, and the contested ground will remain contested.

The solution is to strike an ad hoc committee composed of key stakeholders with a personal stake in advancing MR institutionalization. Early adopters, IT support staff, and the dean and president should represent the core membership of a committee that not only speaks for the competing interests but also is part of a solution that functionalism sees as parts of the whole working together to establish equilibrium. Furthermore, the committee would bring together expertise on the required subject matters—andragogy, technology support, decision-making capacity such as budgeting, and institutional vision. NIT describes how informal structures can influence formal structures (DiMaggio & Powell, 2000; Powell & DiMaggio, 2012), which provides hope for such an initiative.

Professional learning communities, as proposed by Hord (1997), offer potential for continuous inquiry and improvement. Monthly meetings would allow for persistent and reliably frequent sharing of ideas in a nonthreatening manner. Committee work would also allow for shifting a focus from individualism towards consensus and shared values (functionalism) as well as stability-seeking behaviour through dealing with change as an inevitable outcome. It also

builds a larger body of expertise to provide needed support to the early and late majority in the adoption process.

The cost of this solution is already built into salaries at College X; however, time is needed for such a committee to exist. This effort would take about two hours monthly, for at least 3 to 5 years. The downside to this solution is that it might not be formalized and will outlive its useful self, in which case the committee would dissolve. It will be important to keep acceleration and mobilization efforts moving forward to stimulate engagement and celebrate victories along the way. Although efforts should be made to communicate decisions with the wider institutional community, the real victory will be in supporting both administration as well as faculty realms by inspiring desire to integrate MR, addressing some of the needs of competing strategies, and ultimately communicating more broadly to raise awareness in the community. Community awareness can be increased through a low-budget strategy of weekly social media posts about how MR technology is being used on campus by myself, but it could also be supported through more formal channels through the communications department of College X.

I fully expect that increased and improved communication through an MR institutionalization committee will serve to help overcome the point of contention: integration. This will be shown through coordinated efforts with the internal data collection solution, which will allow College X to better assess the progress and institutionalization efforts in an empirical form.

Although the outcome of committee work is not guaranteed, the importance of nurturing mutually beneficial relationships should not be understated. It will be important for those stakeholders present in a meeting of contested territories to be honest, open, vulnerable, and

unwavering in their truth to move forward in an ethical fashion. The next section discusses the implication of leadership ethics as it pertains to the advancement of MR institutionalization.

Leadership Ethics and Organizational Change

As previously discussed in Chapter 1, the institutionalization of MR technology is a challenge that HEIs will inevitably face in the future. Aside from technological, implementation, and faculty adoption barriers, what remains to be discussed are the ethical considerations involved in leading MR institutionalization. Although there are always ethical considerations for leading change, the specific circumstances of MR institutionalization within HEIs give rise to new ethical considerations that must be discussed. It becomes important to identify and address the pluralistic values that exist within an organization to do no harm while leading organizational change. Value pluralism is understood to mean different stakeholders have different values, sometimes in conflict, and that each may be equal and correct (Salvi, 2012).

Olcott, Farran, Echenique, and Martínez (2015) brought to the fore specific ethical recommendations for institutionalizing digital education tools in HEIs. Their research suggested that technology needs to reach all members of society, values are explicit, technology is used for good, no harm be done, and individual and collective commitment determines responsible use of technology. Applied to College X, these ethical recommendations for MR institutionalization can be realized in the following manner.

Equality of Opportunity

Doppelt (2001) described equality as the opportunity to participate through the use of digital technology. Applied ethically to College X, MR technology should be made available to all students and faculty; this *is* equal opportunity in action. Even though, as previously mentioned, some departments have more interest than others, the offer to include all departments

must still be made. The decision to participate or to self-exclude must be made by each department in turn. Value pluralism determines that departments value MR technology differently, and neither is wrong in those values. Referring back to NIT, the pursuit of legitimacy will inform departmental decisions to participate. Within a discipline, if the greater professional body external to the HEI normalizes innovation like MR technology, adhering to these standards becomes the path to legitimacy. What remains is a decision by HEI leadership to extend the offer to participate to all departments.

Explicit Values

Olcott et al. (2015) asserted that ethical use of digital technologies requires that explicit institutional values align with their use and implementation. In this sense, MR institutionalization cannot be realized if the explicit values of education and the organization are not constantly applied. Sometimes values are sacrificed in order to gain access to a new technology. At my institution the ethical application of this principle would be to ensure that the value of innovation is commensurate with the value of socially responsible education. This means, once again, ensuring that the opportunity to access MR technology is extended to all students. Although this is simply not viable at the outset given the lack of resources—MR hardware—what remains is the ethical and value commitment within a program to offer access to MR technology to all students. Upon further acquisition of resources, based on internal data, access can be extended and offered more broadly.

Technology for Good

Technology is not neutral (Polgar, 2011). In fact, it can be used not only for beneficial purposes but also for nefarious endeavours. MR technology is no different in this regard, and it will be very important as MR institutionalization advances that careful monitoring of its use be

performed in order to ensure appropriate use of the technology. Though it is impossible to predict all of the nefarious uses of the technology, referring back to explicit values, it will be very important for College X to uphold the value that MR technology be used judiciously and respectfully in keeping with institutional values.

Responsible Use

In conjunction with the earlier ethical considerations, it will be important to become increasingly aware of the institution's use of MR technology. By pausing to consider whether use of the technology is beneficial and how so, faculty might also begin to develop empathetic connections to those that are indirectly benefitting from their increased comprehension of difficult concepts. Jacoby and Coady (2017) asserted that MR-mediated empathetic connections between participants and subjects are possible. As an example, a Salter-Harris fracture is not always apparent on an X-ray. Professionals often question if the patient is actually injured and consequently treat patients with disdain: *They must be faking the pain!* Visualizing the same injury using MR would provide an entirely unique perspective, as the injury is more apparent. Upon self-reflection, the benefit is less about visualizing difficult concepts, and more about the benefit of empathetic connection with patients.

Taken together, the four values for ethical organizational change will promote a sustainable path forward for MR institutionalization through digital transformation at College X by aligning the ethical considerations with institutional values.

Chapter 2 Summary

This chapter discussed how AL and DL will help propel change forward, characterized the type of change required as adaptive, and presented the conceptual model for change, TSTI. The path forward requires work within the existing organizational setting to accentuate and

enhance the strengths currently in place and to prepare for resistance from known barriers. The primary goal is to derive informal leadership through communicating with administration to sway them to formally strike a sustainable technology institutionalization committee. The aim is to rely on AL and DL to be an effective and efficient contributor as part of this task culture endeavour. The next chapter articulates the implementation, evaluation, and communication plan that will bring the theory to life within the practical organizational context of College X.

CHAPTER 3: IMPLEMENTATION, EVALUATION, AND COMMUNICATION

This chapter outlines the strategy to be used for the implementation of the plan, describes the change process monitoring that will be leveraged, and discusses the communication plan to engage stakeholders. Additionally, the next steps and future considerations related to the digital transformation and institutionalization of MR are presented. Based on the conceptual model presented in Chapter 2, TSTI, the implementation, evaluation, and communication plan presented here relies on a functionalist and NIT-informed approach. My personal leadership, wherein I will take direct responsibility for nurturing the plan, relies on AL and DL concepts that are optimally aligned to address the adaptive change required to digitally transform College X.

Change Implementation Plan

Keeping in mind that the overall OIP goal is to develop a sustainable institutionalization plan for MR, this section outlines the goals and priorities for the change implementation plan. The strategy demands that the implementation, monitoring, and communication plan align with the institutional context and demands of the unique nature of the PoP within College X. To better understand how the individual parts of the whole plan act in support of the overall goal, the plan is disaggregated into its constituent parts for the purposes of discussion.

Goals, Priorities, and Strategies of Planned Change

In Chapter 2, the overall solution for change was revealed to be the adaptation and alignment of institutional processes. To this end, Cawsey et al. (2020) urged readers to consider the change type that best suits the context. Programmatic or thinking-first change (Mintzber & Westley, 2001; Nohria & Khurana, 1993) is preferred because the organizational context is clear, change is incremental, and the plan is well structured. A change implementation plan summary,

shown in Table 3, disaggregates the plan into the constituent parts and provides a valuable visual aid to see how the parts work together.

Table 3

Towards Sustainable Technology Institutionalization: Change Implementation Plan

Goals and priorities	Implementation process	Implementation issues and limitations	Supports and resources	Stakeholders and personnel	Timeline
Collect internal data	Submit data request form to Institutional Research department Discuss data required with CIO, early adopters, and Institutional Research	Need to provide rationalization for request Need to confirm hierarchical support Rejection of request Informal data collection contingency plan	Institutional Research (runs survey tool and provides expertise) CIO and early adopters Cost: $2,000	Institutional Research CIO Early adopters President Dean and associate dean Program leaders Faculty (survey targets)	Submit data request form before September 2020
Establish digital equity	Gather information and use institutional Situation-Background-Assessment-Recommendation template to write and submit a proposal	Time required during my development time this summer to complete the writing process Rejection of proposal	The OIP (provides ample research to include in the proposal) Peers (have wealth of experience and can provide feedback on proposal) Cost: $40,000	Program Leader Faculty peers Dean	Submit proposal before September 2020
Build expertise capacity	Have informal conversations within my professional network	Conflicting schedules Potential that committee is not recognized or supported Too few interested members Imbalance of committee members Ambiguous agenda	Release time Meeting room allocation Hierarchical interests and desires for innovation and promotion Ability to select membership Creation of a clear mandate at outset; invite contributions around concrete agenda—stay on task Cost: $4,000	Faculty Administration IT staff	Have discussions prior to December 2020 Strike committee before end of January 2021 Showcase MR use after April 2021; ongoing afterwards
Enhance hierarchical communication	Draft emails once per semester Make use of existing social media professional accounts to showcase MR in use	No issues foreseen with writing emails to dean and president—they are encouraged and invited Social media audience is limited —dean and president already part of professional network on social media; external stakeholders might not be aware of activities	Existing social media tools Professional network sharing posts will help spread the word Cost: $6,000	Program leader Dean President Professional network active on social media	Email progress reports starting September 2020 Make social media posts starting September 2020; ongoing thereafter

Note. CIO = chief information officer; IT = information technology; MR = mixed reality.

The overall goal of the OIP is to develop a sustainable MR technology institutionalization plan for College X. The OIP is explicitly aligned with institutional strategy supporting creativity and innovation. Four underlying priorities summarized in Table 3 aim to address the institutional gaps identified in Chapter 2. The connection between them was previously explained in depth in Chapter 2; a brief reminder of the linkage will advance understanding of the disaggregated plan. To this end, collecting data about MR addresses the issue of constrained resources, establishing digital equity allays concerns about sectorial striation, and building expertise capacity focuses on the lack of action, nascent technology, limited demand, and a lack of best practices. Finally, enhancing hierarchical communication takes aim at the lack of desire, competing strategies, and lack of community awareness.

The next section discusses each priority with attention given to managing the transition plan.

Managing the Transition: SMART Goals

SMART—specific, measurable, attainable, realistic, and time-constrained—goals serve to help articulate and refine plans. In an educational setting, they can help to target efforts that support improving processes and programs (O'Neill, 2000). The SMART goals presented in this OIP aim to advance and support the overarching goal of adapting and aligning (Cawsey et al., 2020) institutional processes through programmatic change (Nohria & Khurana, 1993). They also align with the institutional context and are grounded in the theoretical framework with which the PoP was analyzed. This section begins by establishing and articulating how the priorities adhere to the SMART goal criteria. The plan also addresses stakeholder reaction, engagement and empowerment, supports and resources, potential implementation issues,

building and maintaining momentum, and limitations to the plan. Table 4 shows how the SMART goals align with each priority.

Table 4

SMART Goals Aligned with OIP Priorities

Priority	SMART goal
Collect internal data about MR institutionalization	Identify the domains about MR institutionalization to be captured in consultation with CIO and early adopters by September 2020. Submit a Request for Data Form to Institutional Research by September 2020 requesting the capture of MR data: hardware, software, availability, accessibility, use, location, and so on.
Establish digital equity	Gather information and submit a proposal by September 2020 for 30 MR-enabled iPads for my students to use in their studies.
Build expertise capacity	Identify allies within the institution and discuss MR sustainability issues with them by the end of December 2020. Assess participation interest and seek out interest convergence potential among allies by the end of December 2020. Seek to create an MR technology committee by the end of January 2021, with an aim to develop an MR institutionalization agenda. Suggest challenges and ask questions about the use of MR technology to the committee to promote use, reflection, growth, and sustainability of MR technology. Lead the showcasing of MR integration with andragogy as part of a monthly livestream activity on a private YouTube channel by April 2021.
Enhance hierarchical communication	Report on MR institutional efforts via email to the dean and president once per semester, starting September 2020. Promote MR technology use directly to key stakeholders via social media regularly.

Note. CIO = chief information officer; MR = mixed reality; OIP = Organizational Improvement Plan; SMART = specific, measurable, attainable, realistic, and time-constrained.

Although alignment of SMART goals with OIP priorities ensures coherence, what remains is a validation of the SMART goals. A rationalization that shows how the articulated goals adhere to the SMART criteria described by O'Neill (2000) appears in Table 5. The closer that the goals adhere to the criteria, the better chance they will stand to be successful. Table 5

highlights how the SMART goals meet the criteria and presents a rationalization for each element.

Table 5

SMART Goals for a Sustainable MR Technology Institutionalization Plan

Criteria	Rationalization
Specific	Plan focuses on my locus of control and effort Other key departments and stakeholders are identified Preliminary costing for proposal done Proposal process familiar and known Initial outreach about interest convergence and excitement based on established relationships is well within my realm Channels for communication identified and confirmed with key hierarchical stakeholders
Measurable	Formal data collection is prima facie happening or not depending on the outcome of the data request form Proposal process requires close personal monitoring; approval or rejection is self-evident Willingness to take part in a committee is shown through ad hoc formation Actually meeting will establish success YouTube view counter measures interest, request from faculty interested in using MR measures advancement of institutionalization
Attainable	Plan is process oriented as opposed to outcome based Focus of plan is on personal locus of control The goals are well within my skill set Resources exist and finances and time can be prioritized Goals are all aligned with institutional context
Results-oriented	Formal data collection will show sporadic use and high interest among faculty Expectation that proposal will be successful Committee should easily be established, and an agenda created New users will be hungry for sandbox play time to gain confidence with new hardware and software Slow uptake expected at first, then as more successful lessons are created, it is expected that demand for shared knowledge will grow quickly
Time-constrained	Dates are provided alongside each goal Goals are based on my personal effort, not the outcome of the initiative Time-bound constraints are within my control

Note. MR = mixed reality,

Careful consideration for the criteria of the SMART goals has helped me to create a plan that best addresses the PoP considering my institutional context. As noted in Table 5, the goals are specific in that the primary focus is on my personal locus of control and effort. This plan relies on an *initiative* construct, rather than an *outcome* construct, because there is more concern with what is immediately possible given available skills and realm of influence. Where possible, key stakeholders are identified, and facts, figures, and processes are named. Furthermore, the goals are measurable in that they are either happening or not—self-evidence of their initiation informs progress. The goals are attainable in that they are aligned with institutional context and well within capacity to execute given the resources available. The expected reasonable results are that data will be collected, the proposal will be submitted, a committee will be struck, and expertise will develop and be shared over time as awareness increases.

With the plan articulated and verified through SMART goal criteria, it becomes important to discuss a path forward that outlines how to plan and manage the transition. The next section discusses the management plan with the overall four priorities in mind.

Managing the Transition: Key Considerations

Managing the plan requires careful cultivation of key considerations to help lead College X. Cawsey et al. (2020) suggested that as part of the CPM, leading change requires that close attention be paid to context, including the key considerations discussed in this section. The structure of the OIP further identifies and requires that specific key considerations be addressed: strengths, assumptions, stakeholder reaction, engagement and empowerment, supports and resources, and limitations. These are discussed in the next section.

Strengths. Beabout (2015) asserted that small goals are easier to achieve because they are more within reach. Furthermore, having smaller goals that are collectively part of a whole

aligns with functionalism (Stepnisky, 2019). The strength of the change implementation plan is that most of the goals and disaggregated activities are within the locus of personal control. The goals are framed from the initiation standpoint, in order to assume the responsibility for action. The plan is realistic and the likeliness of success is high. The goals are structured around relational capacity as well as activities that will leverage personal strengths—small yet significant actions hold great promise when taken together.

Assumptions. The disaggregated plan relies heavily on personal relationships cultivated over many years. Solomon, Allen, and Resta (2003) highlighted the importance of positive relationships within personal and professional networks and how they can beneficially influence change plans in HEIs. Similarly, some of the assumptions identified are inherently predicated on continued, mutually beneficial professional relationships as people collectively work towards institutional goals. The innovation agenda is featured prominently in the institutional strategic plan; continued investment in this priority is critical to advancing this OIP—without this key beacon of direction, implementing the OIP will become problematic. The assumption is that this strategic direction will continue to exist and that it will be acted upon by senior leadership at College X.

A second major assumption on which the success of the plan is dependent concerns the actors themselves. Valleala, Herranen, Collin, and Paloniemi (2015) highlighted the key role that actors play in organizational change, both as proponents and as detractors. Currently, key players are fulfilling supportive senior leadership roles. If there are any changes in those offices and the replacements decide to change course, the likeliness of success of this OIP becomes threatened.

Stakeholder reaction. Frijda and Mesquita (2000) explained that stakeholder reaction to change is an important consideration, and the reaction needs to be nurtured: benefits, relevance,

and values alignment are critical. To this extent, the priorities outlined in the plan span a wide group of stakeholders; institutional context dictates that their response should fall in line with their roles as long as stakeholder needs are cultivated (Frijda & Mesquita, 2000)—Chapter 1 revealed that College X is based in a role culture; stakeholder reaction is expected to follow perceived impact on stakeholder roles.

Regarding the planned request for data, the Institutional Research department will see this as part of their role if the proper procedure is followed. The president and dean are supportive of evidence-based practice, and a brief rationalization about the need for data to support an institutional strategic direction will be supported. Preliminary discussion with the chief information officer (CIO) has already raised awareness of the need for data, and they are enthusiastic about advancing with this initiative. Program leaders in other departments will be interested or not in taking part in the data collection simply based on their level of interest in MR. To increase understanding among peers, collecting data will be rationalized through the institutionally accepted lens of sustainability. This should allay any fears of losing resources. The communication plan will emphasize that the data will be used to connect and expand expertise, not constrain and segregate.

Establishing digital equity requires that a proposal be submitted for acquiring hardware and software. This endeavour has been successful before, and administration has invited additional submissions. Stakeholders—president, dean, peers, and students—are fully expected to welcome the approach to establishing digital equity; it is aligned with institutional values.

Building expertise capacity will be met with acceptance by administration as well as faculty who are interested in expanding their skills. Early adopters have already self-identified, and others should come forward when opportunities to take part present themselves. Faculty who

are considered laggards will not be interested or participate; NIT also shows that departments that do not need MR technology as part of legitimacy-seeking behaviour will not be interested in adopting or integrating it into praxis.

Enhancement of hierarchical communication is welcomed by the dean and president. In their roles they always appreciate being informed of innovative teaching that takes place within the institution. Regardless of the method, formal or informal, they often solicit opportunities to celebrate innovation and to promote initiatives that serve the college's strategic direction.

Engagement and empowerment. Bolman and Deal (2013) emphasized the importance of engaging and empowering stakeholders during organizational change. In relation to the structural and political frames described (Bolman & Deal, 2013), significant engagement and empowerment has already been initiated. Specific to building expertise capacity, significant groundwork has already been established through professional relationships across departments. There is already significant interest from other faculty who are eager to leverage MR in their andragogy. Additionally, I will continue to forge mutually beneficial relationships with personnel in the Centre for Excellence in Teaching and Learning, IT, and external partners. Showcasing the possibilities of MR through learning festivals on campus as well as through YouTube videos ensures engagement as well as prompt accessibility for interested members of an unofficial professional learning community.

Supports and resources. Although they are not extensive and overwhelming, it is reasonable to request supporting resources for the execution of this plan. Ku (2009) established clearly that supports and resources are critical to the institutionalization of technology in HEIs. As applied to College X, to acquire data, technological support from the Institutional Research department is required to not only build the survey but also report the results. Establishing digital

equity requires that I set aside time to write the proposal. This can easily be done during scheduled development time. Building expertise capacity requires that meeting rooms be booked through institutional scheduling; rooms are readily available. Social media communication requires accessible accounts; these have already been created and can be leveraged to promote activities involving MR technology.

Limitations of the implementation plan. Kohoutek (2013) implored readers to consider limitations to change plans in HE; ignoring them does not allow for contingencies. A few limitations will constrain the plan. First and foremost is funding. Although funding for upstart resources thus far has been accessible, it has been one-time funding only. The challenge becomes to convince the president or dean to operationalize the cost of recurring expenses related to the plan. Second, formal data collection requires agreement and prioritization. The plan is framed based on a process already set up by College X. It is possible to pursue requesting data collection, but ultimately if administration does not agree or see the value in collecting data about MR at College X, it hinders the ability to make the case for resource allocation. A contingency plan for informal data collection will need to be considered. Lastly, time will always be a constrained resource and limit the ability to progress with the plan. Aside from regular duties, allies will need to be energized and motivated to carve out time to meet and contribute to advance the MR sustainability initiative.

Potential Implementation Issues

Given some of the identified limitations, careful consideration for mitigating these obstacles will help to provide continued hope for success. It has been known for some time that when it comes to institutionalizing technology in HEIs, mitigating risks to implementation and institutionalization is critical (Hannah, 1998). In terms of funding, the core issue of sustainability

is not entirely threatened. In fact, only the growth—and diffusion—of MR will be hindered. If no more funds are accessible tomorrow, the current hardware and software is still capable of being integrated and used effectively by the small group of faculty who are early adopters. Should demand outstrip what is limited by the hardware available, there are external funding options to consider; allies, represented by early adopters, have already discussed possible grants to pursue. In the meantime, the OIP focuses efforts internally.

The second reality this OIP might face is having the Institutional Research department reject the request for data collection. My sense is that this is unlikely, mostly because preliminary discussion with the CIO supports the need to collect this data. Should the need arise, however, effort will be made to understand the nature of the decision to reject the request. Professional and personal relationships will be leveraged to find out more about the rationale for rejection before strategizing a response. Formal application through the research ethics board of College X might be needed. More senior peers who have experience with the process have offered to provide mentorship should it be required.

Although informal data collection is entirely possible and within my realm of influence, it might not be widely accepted. Additionally, informal data collection would involve additional time, effort, and technological savvy to enact. Alternatively, and drawing on my AL style, I will pursue hierarchical influence by discussing the importance of formal data collection with senior leadership. Allies like the CIO represent a significant voice in this regard. According to Cawsey et al. (2020), my institutional context is well suited to this approach, and this limitation will be navigated by leveraging relationships with the dean and president to request that formal data collection be reconsidered. My experience and current understanding of institutional context

informs me that decisions are made based on evidence. Accordingly, without data, advancing MR institutionalization sustainably will be stymied.

Lastly, regarding the limitation of time, it would be remiss of me to ignore a technological solution given the nature of the OIP. If the worst-case scenario arises and the ability to hold meetings is threatened due to time limitations, it will be addressed through a technological solution. Asynchronous meeting tools like Microsoft Teams will be used to host virtual meetings—we already make use of Microsoft Teams throughout College X.

Building and Maintaining Momentum: Short- and Long-Term Goals

Stephens, Hernandez, Román, Graham, and Scholz (2008) articulated a balanced approach to sustainability of technology in HE by complementing momentum gained through short-term victories with the guidance of broader long-term goals. This approach works well with the OIP because it supports and aligns with the functionalist perspective that sees smaller parts working together as a whole (Stepnisky, 2019). As part of the plan, the short-term goals are to submit a data request form to the Institutional Research department and to write a proposal in support of digital equity before September 2020. The medium-term goals are to discuss the strategic requirement for data with administration, get approval for the digital equity proposal, identify and invite members to build expertise capacity, and begin promoting MR activities through social media and regular emails to the dean and president. Finally, the long-term goals are to achieve digital equity—have hardware available to all my students—to showcase MR use through social media, and to create awareness among stakeholders of the innovative use of MR technology within College X.

This section presented the change implementation plan by disaggregating the overarching goal and making use of the planning templates. The SMART goals and actionable plan have

been critiqued by determining strengths, assumptions, limitations, resources, goals, and how to mitigate expected obstacles. I recognized that no singular approach will advance the plan unscathed, and although obstacles can sometimes be unpredictable, the effort invested in the creation of the plan thus far will best prepare it to be adapted to a dynamic institutional context over which there is little control.

Yarime et al. (2012) highlighted the importance of change process monitoring and evaluation for the purposes of sustainability and institutionalization efforts in HE. The next section heeds their advice, turning attention to a discussion about monitoring and evaluating the change process at College X.

Change Process Monitoring and Evaluation

As mentioned in Chapter 2, the Plan-Do-Study-Act model proposed by Cawsey et al. (2020) demands that change is tracked through data collection as evidence. The Kaizen model leveraged for the OIP similarly makes use of data through the Plan-Do-Check-Act cycle (Singh & Singh, 2009). The tools are one and the same with the only difference being semantic; the *check* stage has been renamed *study* to reinforce the importance of thinking about the data, not just observing it (Dew, 2009). Both tools, as part of their parent models, reinforce the importance of tracking progress, which validates change inputs as part of the OIP.

Given the organizational context of College X and the nature of the PoP, it was challenging to find an appropriate tool aligned with the change plan as well as the leadership approach to change. The primary considerations when searching for an assessment tool were that it must address the topic of digital transformation, must be suitable for the HEI setting, must be flexible enough to adapt the metrics to the setting, and must align with functionalism and NIT.

Additionally, it was important that the tool itself was descriptive and not prescriptive, in order to allow for the enactment of the personal leadership approach to change.

Despite my expectation that there would be an established body of work at the confluence of change theory, digital transformation, and HEIs, research revealed that although there was much written about these domains in isolation, only a small body of work related to the integrated area of interest. A singular tool emerged: the digital capabilities maturity model (DCMM). It aptly measures and monitors the capacity of an organization for digital transformation (Uhl et al., 2016).

The DCMM is a new, holistic monitoring tool that focuses on the technical side as well as the organizational side of digital transformation. It is a suitable fit for the OIP because it takes a maturity approach, where identified domains are assessed based on how well they are developed. The rationale is that the better developed the domains are, the more capable the institution is to undergo digital transformation. Furthermore, the holistic focus is aligned with functionalism—seeing the parts working together as a whole—as well as NIT—behaviours attributed to the environment. Additionally, the DCMM is descriptive; it paints a picture of the current organizational situation and allows for leadership approaches to be enacted. Whereas prescriptive tools direct a course of action based on results, or monitoring of change initiatives, the DCMM allows for more nuanced approaches to change.

Research revealed many technology-focused assessment tools for digital transformation; however, the significance for College X is that the DCMM has been studied within the organizational realm of HE by Kozina and Kirinic (2018). The applicability of the DCMM is further advanced by the notion that not all metrics need to be included, and they can be adapted

to suit unique institutional settings. The key points arising from Kozina and Kirinic are that the metrics are holistic, both technical and organizational, and maturity is assessed across domains.

The following section describes the levels of maturity that comprise the DCMM, identifies the metrics and domains to be monitored in the OIP, and discusses the initial adaptations made to the DCMM. Alignment of the DCMM with the OIP goals is also articulated.

Maturity Levels

The maturity levels of the DCMM are categorized based on a trajectory from initial, reactive, defined, managed, through to excellence (Kozina & Kirinic, 2018). The initial maturity level is characterized by an absence or complete lack of digital capability. Whatever key domain is being assessed, absence reflects the reality that it is absent within the institution. The reactive maturity level is characterized by reactive, ad hoc, unstructured capability. The defined maturity level is characterized by planned and partial processes. The managed maturity level is characterized by well-established processes and integration. The excellence maturity level is characterized by full implementation with continuous optimization and improvement. As applied across the domains, each key area to be assessed is qualitatively described by a discrete maturity level description and a score is assigned, ranging from 1 (*initial*) up to 5 (*excellence*).

Domains

Although the DCMM focuses on technological as well as organizational domains, it is also flexible enough that it allows for situational context. To this end, initial adaptations to the DCMM were made to align with the OIP goals. Moreover, customization of the DCMM has allowed me to propose an implementation plan-monitoring rubric. The adapted DCMM aims to achieve the same end: Assess the capability of College X to undergo digital transformation. Table 6 presents the adapted DCMM assessment rubric to be part of the monitoring plan. The

maturity levels for innovation as a digital capability are presented horizontally across the top of the table, from initial through to excellence, and the domains are presented vertically along the left side.

The domains thus identified and to be assessed have become data acquisition, digital equity, expertise capacity, and hierarchical communication. The qualitative maturity level descriptions have been leveraged and applied to the domains across the rubric to generate descriptive conditions that should be easily identifiable within College X. Moreover, as shown in Table 6, this tool takes into consideration objective as well as subjective data. Taken together, they describe the current digital maturity of College X as it relates to digital transformation. In context, this refers to the sustainable institutionalization of MR technology.

Table 6

Adapted DCMM Assessment Rubric

Key areas	Initial (1)	Reactive (2)	Defined (3)	Managed (4)	Excellence (5)

Data acquisition	MR data is not collected	MR data is informally or partially collected	MR data is formally collected	MR data is well defined and formally collected	MR data is fully identified and formally collected
Digital equity	Institutional MR hardware and software is absent	Institutional MR hardware and software is partially present within a class or program	Institutional MR hardware and software is mostly present within or across a department	Institutional MR hardware and software is well established and present within or across a school	Institutional MR hardware and software is ubiquitous across the institution
Expertise capacity	No use or interest in use of MR	Early adopters are identified	MR integration is present, knowledge is shared, and wider interest from stakeholders is identifiable	Professional learning community, committee, or both are formed, MR agenda is in place, strategic plan is aligned	MR expertise is prevalent across a broad base of users; MR literacy is continuously improving, with full alignment of activities with the strategic plan
Hierarchical communication	No communication about MR	Sporadic informal communication about MR is broadcast	Regular formal and informal communication is broadcast	Communication is broadcast and inquiries about MR are incoming from stakeholders	Multiplatform communication about MR is ubiquitous

Note. MR = mixed reality.

The resulting application of the adapted DCMM assessment tool can be plotted on a radar graph to show the digital maturity of College X as it relates to the identified goals. Figure 7 shows how the DCMM adapted domains are visualized. It makes use of the domains in the DCMM rubric (Table 6), with the maturity level score plotted on the concentric rings. The plotted spots are connected and form a trapezoidal area. A larger area indicates more digital maturity. Because this assessment tool is descriptive and not prescriptive, it invites a leadership response based on intimate knowledge of the initiatives, resources available, and timelines associated with the objectives.

Figure 7. DCMM radar graph. Adapted from *Digital Enterprise Transformation* (pp. 52), by A. Uhl, M. Born, A. Koschmider, and T. Janasz, 2016, New York, NY: Routledge.

As it pertains to the overall change plan, and aligned with the CPM plan described by Cawsey et al. (2020), the strength of the DCMM tool is that, at the outset, it allows for consideration of the existing climate and provides a baseline. At the beginning of the plan the DCMM tool will help to develop milestones, in the middle of the plan it will allow for monitoring and celebration of progress, and in the end it will confirm that inputs successfully created a climate supportive of sustainable digital transformation and MR institutionalization.

Although I have conceived this rubric initially, further refinement will be made by collaboration with early adopters and the proposed sustainable technology institutionalization committee. Preliminary discussion with the CIO indicates that they are interested in deploying this tool as part of their institution-wide continuous improvement monitoring plan. Engagement with allies and brokers to aid in the assessment, monitoring, and implementation of the adapted DCMM will reduce the inherent bias of the process.

I have proposed to the CIO that the rubric should be deployed on an annual basis, concurrent with the end of the fiscal year. This decision is strategic in that any leftover funds in

budgets are often spent at this time of year, and the ability of the DCMM to quickly assess and communicate the current situation could have beneficial impact in support of digital transformation efforts at College X. Results of the DCMM would be made available to senior administration as well as the sustainable technology institutionalization committee. The results of the DCMM implementation will provide feedback about progress towards sustainable institutionalization of MR technology at College X.

Additionally, should the need arise, the DCMM can be relied upon for an instantaneous snapshot of the digital capability maturity level of the institution. The DCMM can be rapidly deployed, and the metrics are well defined; progress of the plan can easily be assessed and monitored. Leadership decisions about appropriate course of action to advance the plan can be reliably informed by the most up-to-date information in an agile manner. The radar graph is self-evident as to areas that require support as well as areas that are thriving and maturing. Evidence-informed leadership decisions based on the data can be enacted explicitly; reflecting on the results of the DCMM monitoring reveal progression of the plan.

The domains of the DCMM have been adapted to align with OIP goals and priorities without losing sight of, or sacrificing, the intent of the DCMM, which is to consider technological as well as organizational aspects of digital transformation. The next section discusses the plan to communicate the change process. Given that there are many stakeholders involved and they will all be affected differently, it will be important to consider how information about the digital transformation within the organization is communicated with them.

Plan to Communicate the Need for Change and Change Process

The problem with any change plan within an organization, regardless of the nature of the change, is that actors need to be persuaded to move in a common direction (Cawsey et al., 2020).

Isern and Pung (2007) asserted that the three goals for communication about the change plan are to minimize the effects of rumours, to mobilize support for change, and to sustain enthusiasm and commitment. Given this universal problem and supporting goals for a communication plan, the challenge thus becomes to create a communication plan that not only persuades stakeholders to move in a common direction but also supports and aligns the communication goals with the implementation plan.

This section discusses the communication plan framework with a brief look at context. Additionally, a temporal communication plan is integrated with stakeholders by discussing a communication strategy addressing unique communication goals. Specific communication challenges are revealed that demand careful attention to allay concerns.

Communication Plan Framework

The overall communication plan framework keeps in mind Isern and Pung's (2007) advice about the three goals and is grounded in two factors: temporal execution, or stage of the plan, as well as the intended audience, or stakeholders targeted. At each stage of the plan, a strategy to communicate is presented that optimally addresses Isern and Pung's benchmarks and targets specific stakeholders.

Klein (1996) presented six principles that should underlie an effective communications strategy: message and media redundancy, face-to-face communication, line authority, immediate supervisor, opinion leaders, and personal relevancy. These principles are applied to the influence strategy. Furthermore, Kotter and Schlesinger (1979) presented seven influence strategies that have been considered as part of the communications strategy: education and communication, participation and involvement, facilitation and support, negotiation and agreement, manipulation and cooptation, explicit and implicit coercion, and systemic adjustments. This will not only serve

to bring stakeholders onside but also to alleviate dysfunctional resistance. Taken together, for each stage of the plan, and considering the stakeholders, Kotter and Schlesinger's influence strategies have been leveraged, keeping Klein's key principles in communicating change in mind.

Context in Brief

As discussed in Chapter 1, an explicitly articulated institutional strategic direction for College X (2016) is innovation. Additionally, MR technology has been identified as part of the innovation agenda at College X (2015, 2018b). As discussed in Chapter 1, a gap analysis revealed that MR initiatives have thus far been advanced on an ad-hoc basis, faculty adoption is sporadic, and integration is even less consistent—institutionalization is far from reality. Furthermore, a PESTE analysis showed that although the environment and institutional context is ripe for cultivating an MR institutionalization plan, an implementation and communication plan must coordinate efforts and align resources with strategic direction. To this end, education, participation, facilitation, and negotiation are all required to bring stakeholders onside. Furthermore, if close attention is not paid to credibility of the source, amount and frequency of the message, transparency of the communicator, and feedback about the process, communication will not be effective (Davidson, 2013) and the change plan will fail.

Communication Objectives

Communication objectives have informed decisions about influence strategies. At College X, trusting professional relationships have already been cultivated between and among faculty and administration. The challenge becomes to leverage these trusting relationships to establish the need for change, build awareness of the benefits of institutionalizing MR as an

educational technology tool, actively communicate goals of change, mitigate resistant attitudes, seek feedback, and celebrate the impact of change.

Communication Plan

The two primary factors considered for the communication plan are the stage of the plan (temporal) and the stakeholders (audience) involved. The influence strategies—introduced earlier in Chapter 3—are education and communication, participation and involvement, facilitation and support, and negotiation and agreement. Manipulation or coercion have been excluded as they are incompatible with my leadership styles, AL and DL, which are predicated on trust. Furthermore, systemic adjustments to quell resistance to change have been excluded because they are not within my professional realm of responsibilities. Should the need arise, direct conversations with the dean, CIO, or president are possible in order to raise awareness of the issues that require systemic adjustments.

As outlined in Table 7, at each stage of the plan stakeholders are influenced by making use of one of the remaining four influencing strategies: education and communication, participation and involvement, facilitation and support, and negotiation and agreement (Kotter & Schlesinger, 1979). Different influence strategies need to be employed according to the unique context presented by the stakeholder group involved as well as the stage of the plan.

Table 7

Influence Strategies

Stakeholders	Stage			
	Prechange approval phase	Developing the need for change phase	Midstream change and milestone communication phase	Confirming and celebrating the change phase
Administration	Education and communication Negotiation and agreement	Participation and involvement	Facilitation and support	Education and communication

Faculty and staff	Education and communication Participation and involvement	Facilitation and support Negotiation and agreement	Education and communication
Students		Participation and involvement Facilitation and support	Education and communication
Employers	Education and communication	Participation and involvement	Negotiation and agreement Education and communication

Dutton, Ashford, O'Neill, and Lawrence (2001) asserted that in the prechange approval phase, top management should be targeted, and the plan needs to link with organizational goals, excluding faculty, staff, students, and employers. In the phase of developing the need for change, the audience widens to include those directly affected by the change and the strategy needs to address the why for change beyond the business case (Birshin & Kar, 2012). During the midstream change phase, progress, feedback, and clarification of misconceptions are key as new structures and systems are put in place (Klein, 1996). Finally, in the confirming and Celebration phase, it is important to not only celebrate accomplished tasks but also reflect on the process to learn about the change experience, or how the change impacted stakeholders (Cawsey et al., 2020).

Specific discussion about the influence strategy used (Kotter & Schlessinger, 1979), along with the principles (Klein, 1996) leveraged for each stage of the plan are discussed, and structured according to the stakeholder group or audience in the next section. Further exploration of the unique needs of each group demands close attention to the communication strategy to effectively work the plan.

Communications with Stakeholders

As mentioned in Chapter 1, College X is entrenched in a role culture where behaviours are defined by an actor's place and title within the organization. This is aligned with an NIT perspective, which explains that behaviours are attributable to the environment and that the organization constrains individualism (DiMaggio & Powell, 2000; Meyer & Rowan, 1977; Powell & DiMaggio, 2012; Rowan & Miskel, 1999). Furthermore, a functionalist perspective supports the notion of constrained choices due to defined roles and sees parts working together as a whole (Garner, 2019; Stepnisky, 2019). Accordingly, it becomes easy to break down the actors into constituent parts for the purposes of discussing an appropriate communication strategy based on their roles. In Table 7, four stakeholder groups are identified: administration, faculty and staff, students, and employers. The following sections discuss the communication plan unique to each group, based on the temporal phase of the plan. Specific discussion about the influence strategy used (Kotter & Schlessinger, 1979), along with the principles (Klein, 1996) leveraged for each stage of the plan, are also discussed.

Communication with administration. During the preapproval phase, the education and communication influence strategy involves explaining the context to administration and engaging them by asking questions that encourage them to explore how they can support the need for moving towards sustainable institutionalization of MR. Kotter and Schlesinger (1979) stated that education and communication is needed for understanding of the change initiative and why it is important. Preliminary discussions indicate awareness exists, but further refinement of the key takeaways is needed. The president and dean are eager to learn about evidence that supports initiatives that bring institutional goals to life.

Furthermore, Kotter and Schlesinger (1979) explained that negotiation and agreement is useful to help those affected by change see the benefit to themselves. To this extent, where education and communication falls short, negotiation and agreement can be used as an influence strategy at this stage in order to demonstrate that there will be significant benefit to them as leaders—delivery on an explicit institutional strategic goal: innovation (College X, 2016). Drawing on Klein's (1996) communication principles, face-to-face communication will be used to accomplish this task because it is the most effective. Once administrators are on board, the potential is high that their influence will be effective due to another communication principle: line authority (Klein, 1996); it is fully expected that a message from the president endorsing and stressing the role of MR as part of the innovation strategic goal will be impactful.

During the phase of developing the need for change, participation and involvement (Kotter & Schlesinger, 1979) will be used as an influence strategy to further mobilize administrator support. Although well developed, the OIP has significant flexibility built in that allows for new ideas to come forward and for deans and chairs to self-identify as interested parties. Message redundancy (Klein, 1996) will be key to ensure that administrators understand the need for change and to allow for them to determine how they can best support the sustainability of MR in their department or program. A small but influential community of faculty dispersed across College X advocates for MR technology. This group of early adopters will be key to engaging their own departments and supporting MR institutionalization by exploring ways that MR can be further integrated and dispersed.

The midstream change and milestone communication phase demands that enthusiasm and commitment are sustained (Cawsey et al., 2020). Administrators will need to be supported and influenced through facilitation to help them adapt to change. Key opinion leaders (Klein, 1996)

will be tasked with working with administrators to keep a positive outlook on the ability to work towards the goal of sustainability.

During the confirming and celebrating the change phase, celebrating accomplishments and reflection on the process will be the primary focus. For administrators, it will be important to help them see how the OIP has improved their leadership goals. The most appropriate influence strategy is to present data collected as a form of education and communication process (Kotter & Schlesinger, 1979), which will help them to reflect on the progress of the plan. The key principle of face-to-face communication (Klein, 1996) will be relied on for the president and deans. Progress reports will be distributed to other chairs and program leaders via email to reinforce message redundancy and retention (Klein, 1996). Feedback will be sought from administrators so problematic issues can be discussed among early adopters and any key stakeholders that have the expertise required to help resolve the issues.

It will be important for administrators to see how the sustainability of MR aligns with institutional goals and how it will help advance their own appropriate deployment of resources in support of the innovation agenda (College X, 2016). The next section discusses how to communicate with faculty and staff.

Communication with faculty and staff. Whereas administrators play out their role behind the scenes, faculty and staff are the front line or face of the institution. Through the execution of their duties, they interact directly with students and are responsible for the delivery of education and support services. This stakeholder group will be the most important group to communicate with because they hold the ultimate capacity and autonomy to support or resist the institutionalization of MR.

During the prechange approval phase, there is no need to communicate with faculty and staff about the OIP. Decisions to support the plan rest solely with administrators at this phase. Although it is inevitable that some information about the OIP will begin to circulate, it will not be until the phase of developing the need for change that education and communication, as well as participation and involvement (Kotter & Schlesinger, 1979), will be relied upon to communicate to this stakeholder group. Nonetheless, it will be important to informally engage this group and to listen to their thoughts about MR institutionalization. As Rogers (2010) explained, DIT shows there will be a wide variety of responses.

At this point, rumours will certainly arise, and it will be important to enact message redundancy (Klein, 1996) in order to reinforce that the primary motivation is to advance the innovation agenda in a sustainable manner. Further, participation and involvement (Kotter & Schlesinger, 1979) is optional, but also highly encouraged. The redundant message will be reinforced and communicated through institutional newsletters, face-to-face—formally and informally—social media blasts, and professional learning networks.

The midstream change and milestone communication phase will be challenged by the need to further mobilize support and sustain enthusiasm and commitment. Faculty and staff who have decided to participate might lose some energy and encounter roadblocks that they do not know how to overcome, such as hardware issues, andragogy integration, software failures, learning management system compatibility issues, and professional loneliness and isolation. Facilitation and support, as well as negotiation and agreement (Kotter & Schlesinger, 1979), will be the key influencing strategies used to communicate with this stakeholder group. A professional learning community will be important to provide a point of contact to help support faculty and staff as they confront issues related to the integration of MR into their work. An

accessible and reliable body of knowledge represented by the professional learning community will also help new participants to see how MR will benefit their andragogy or student service. Opinion leaders (Klein, 1996) will be crucial and are often very effective in a peer-based environment, especially when rapid uptake of a new technology is envisioned.

During the confirming and celebrating the change phase, faculty and staff will need to feel that their work is worthwhile. The key influencing strategy will be education and communication (Kotter & Schlesinger, 1979); data will be shared out through a newsletter as well as a celebratory year-end event for professional learning community members. Face-to-face principles (Klein, 1996) will be enacted to showcase the use of MR as part of the execution of duties, and integration into andragogy will be celebrated. This communication strategy will also serve to inspire new ideas and to create new connections across disciplines.

Communication with students. Communicating the plan with students may be difficult to navigate. Although it would be foolish to exclude student concerns and needs as part of the delivery of education, ultimately it is up to the organization to set the course—the strategic direction of innovation—based on the context in which the institution operates. From this point of view, the professional duty and obligation to provide excellence in education is entrusted to the administrators, faculty, and staff. Student needs and desires need to be considered, but the institution needs to be entrusted to make decisions about delivery. In this light, during the prechange approval phase and the developing the need for change phase, students as a stakeholder group do not need a communication plan.

The midstream change and milestone communication phase becomes central to communication with students, especially as it pertains to mobilizing support; without student demand or participation, resistance will stymy any progress. To this extent, the key influence

strategies to be enacted will be participation and involvement as well as facilitation and support (Kotter & Schlesinger, 1979). Carefully incorporating MR-based learning activities, assessment, and assignments will reinforce a new system and process of learning mediated through an already established learning management system. The key principles at work here will be face-to-face communication, immediate supervision, opinion leaders, and personally relevant messaging (Klein, 1996).

The confirming and celebrating the change phase for students will rely on education and communication (Kotter & Schlesinger, 1979) as an influence strategy, and the key principle of face-to-face communication (Klein, 1996) will best be leveraged to encourage critical reflection about *how* learning has improved making use of the new technology. This will be increasingly important as a feedback tool to further refine assignments and assessments. Targeting the concepts or learning objectives where MR-based activities are employed to advantage represents a ripe opportunity for mobilizing student support and garnering enthusiasm and commitment.

Communication with employers. The final stakeholder group that requires planned communication is composed of employers. There is no plan required for the prechange approval phase; however, the developing the need for change phase requires outreach in order to minimize the effect of rumour and to mobilize support. The influence strategy to be used is education and communication (Kotter & Schlesinger, 1979) to explain to employers that students will be learning skills in a new manner that addresses an emerging reality of the Fourth Industrial Revolution, thereby aligning education with an advancing demand for digital literacy. Opinion leaders providing message redundancy (Klein, 1996) will be key to mobilizing support for MR-based digital literacy skills.

During the midstream change and milestone communication phase, employers will be best influenced through participation and involvement (Kotter & Schlesinger, 1979), and the key principle to be leveraged is personal relevancy (Klein, 1996). For employers on the leading edge of emerging technology, it will be a welcome development to have a partner that is seeking ways to incorporate digital literacy skills such as MR technology into their business plan. One business strategy is differentiation (Das & Joshi, 2007): MR technology as a tool allows business leaders/employers to nurture innovative ways to grow their business and to deliver a service in a different way. NIT says that this informal outside environment will formally influence structure within the employers' businesses, thereby encouraging employers to be more competitive, to remain relevant, and to boost their enthusiasm. The plan seeks to engage employers by asking them how MR technology could help them differentiate, and then seeking collaborative, mutually beneficial processes that enhance the College X–employer relationship.

The final consideration for communicating with employers about the plan is during the confirming and celebrating the change phase. The influencing strategy to be used here will again be education and communication (Kotter & Schlesinger, 1979). Program leaders who are using MR-based learning will be encouraged to leverage their personal relationships with industry partners to showcase how students have incorporated MR technology as part of their learning. Project-based learning will provide excellent exemplars of how new digital literacy skills have helped students tackle modern, relevant problems of value to employers. Through further negotiation and agreement (Kotter & Schlesinger, 1979) as an influence strategy, face-to-face communication (Klein, 1996) will be key to reflecting on how new projects can incorporate the needs of employers.

Communication Challenges

The primary challenges associated with communication are the distributed nature of the technology, as well as the unique settings of the various employers the institution serves. Healthcare is a very different setting than construction. What remains central to the plan, however, are partnerships, education, and the technology itself. In this sense, flexibility and autonomy will be key to advancing MR technology as part of the innovation agenda at College X. Programs will need to collaborate internally as well as externally with their stakeholders in order to make the most of their efforts. Although I do not envision resistance from administration during the prechange approval or developing the need for change phases, it will be difficult to communicate the change during the midstream change and milestone communication phase simply because of the diverse nature of the projects and uses for MR-based technology. Additionally, some resistance is expected from some stakeholders who feel threatened by MR-based activities. In these cases, seeking understanding and clarifying positions through redundancy will be critical to reducing ambiguity and increasing clear and concise messaging. Face-to-face meetings will be leveraged to address personal concerns and to minimize interference.

This section identified the overarching goals. Minimizing the effect of rumour, mobilizing support, and sustaining enthusiasm and commitment will be addressed though targeted communications that address stakeholders at temporally identified phases of change. Influencing strategies and key principles in communicating change have been examined, paying close attention to the optimal approach that aligns with the implementation plan. The following section discusses the next steps and future considerations for the OIP. Relevant new contextual

elements are discussed to ensure that forward-looking forecasts for the sustainability of MR institutionalization remain positive, realistic, and implementable.

Next Steps and Future Considerations

Although the content of this plan is based on the institutionalization of MR, leadership and sustainability are at the core. Furthermore, regardless of the technology involved, relationships and navigating institutional context are paramount to advancing an initiative. When discussing innovation, researchers are not necessarily talking about technology as an educational tool, but discussing and exploring new relationships and negotiating how to best reconfigure roles and tasks to ensure meaningful experiences and effective education for students.

Institutional improvement is part of the continuous improvement process supported through LEAN or Kaizen (Murata & Katayama, 2010; Singh & Singh, 2009). Efforts towards the sustainability of MR and technology institutionalization should focus on the project outliving the leader (Perlmutter, 2020). To this end, the innovation rests with the processes that are put in place to ensure sustainability of an initiative long after a leader has vacated their role. This OIP advocates for the transition from a role culture to a task culture; this is just one example of how a process can support project sustainability. Moreover, Perlmutter (2020) asserted that investing time to complete tasks is key. It will be important to set aside time as part of professional development (annually), collaboration in meetings and committee (monthly), and class preparation time (weekly) to allow for the innovative work to be done in support of MR institutionalization.

Another important consideration for supporting MR institutionalization will be framing innovation as an extension of processes already in place (Perlmutter, 2020). In this sense, integrating MR-based learning activities needs to be promoted as just another option in the

arsenal of delivery or assessment techniques for faculty to rely upon. If MR, as an innovation, is advanced on its own as a different educational tool altogether, it will most likely be met with resistance. The challenge becomes working with interested faculty to help them see how the tool can be just another way of exploring content and discussing ideas with students. More important than digital literacy skills, attitudes toward MR-based learning activities will need to be positively reinforced and nurtured through AL and DL, as discussed earlier.

The hardest task, and yet most evident example proving that sustainability has been enacted, will be the simple fact that MR-based activities are ubiquitous throughout the institution. If MR-based learning activities are no longer seen as innovative—they have simply become normalized—there will no longer be a need to promote them. In a much comparable way that desktop computers have become a staple of institutional offices and now laptops of lecture halls, MR-based technology will eventually become equally pervasive. The primary consideration will be that if MR-based learning activities are functional and productive, the sustainability of MR institutionalization will have been accomplished. Furthermore, sustainability is a clear indication that the relationships are innovative, and the institution has been able adapt to the external environment and ensured legitimization described by NIT. From a functionalist point of view, equilibrium, order, and stability will have been achieved despite the perceived threat that change brings to the organization. If innovation is framed as a way to ensure sustainability, MR-based learning activities will certainly be supported through institutionalization.

Chapter 3 Summary

This chapter discussed the implementation, evaluation, and communication plans for leading the digital transformation of College X. SMART goals that are aligned to institutional

context were disaggregated and explored. It was explained that the functionalist notion of parts working together as a whole (Garner, 2019; Stepnisky, 2019) as well as the NIT idea that behaviours are attributable to the environment (DiMaggio & Powell, 2000; Meyer & Rowan, 1977; Powell & DiMaggio, 2012; Rowan & Miskel, 1999) constrained, yet also provided direction to, the implementation plan. The DCMM was introduced as an assessment and monitoring tool to evaluate change at College X. The strength of assessing objective and subjective data lends itself well to reporting back descriptively about the digital maturity of College X—an intimate response is thus invited and allows for nuanced leadership. This chapter also presented the communication plan, which follows not only the stage of the plan but also takes into account the audience. In closing, Chapter 3 discussed next steps and future considerations, notably that evolving relationships are central to innovation sustainability and digital transformation. Skilled navigation of roles and tasks are foundational to ensuring students are provided with meaningful experiences and effective education.

OIP Summary

This OIP has explored and addressed the confluence of change theory and digital transformation within HEI. The PoP is the inconsistent implementation for disruptive technology at a publicly funded major urban college in BC, Canada. A conceptual model, TSTI, was presented and the contested middle ground between faculty and administration, or collegium and bureaucracy, as the primary concern that prevents technology such as MR from sustainable institutionalization. The solutions presented in this OIP adhere to the framing theoretical lenses of functionalism and NIT and align with theoretically substantiated goals. Evidence-based practice at College X demands that internal data be collected. The value of social justice supports the approach of digital equity. Building expertise capacity requires professional learning

communities. Increasing hierarchical communication requires raising awareness. A descriptive maturity model tool for assessing progress was introduced as it invites nuanced leadership responses that can be adapted to institutional settings. As Solomon et al. (2003) asserted, positive personal relationships are beneficial to executing change initiatives in HEIs. This OIP centred on personal relationships as the cornerstone to improvement, with an eye to expanding the reach of MR technology at College X. Specifically, and in reference to the conceptual model, TSTI, this OIP has aimed to raise the profile of MR technology to a wider audience, thereby encouraging the diffusion of technology across the institution. This OIP recognized the inherent problems at College X and promoted a viable path towards sustainable institutionalization of MR technology.

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